1: Gifford E-4,5 (1920-1921) 1929 009 Tonga 009

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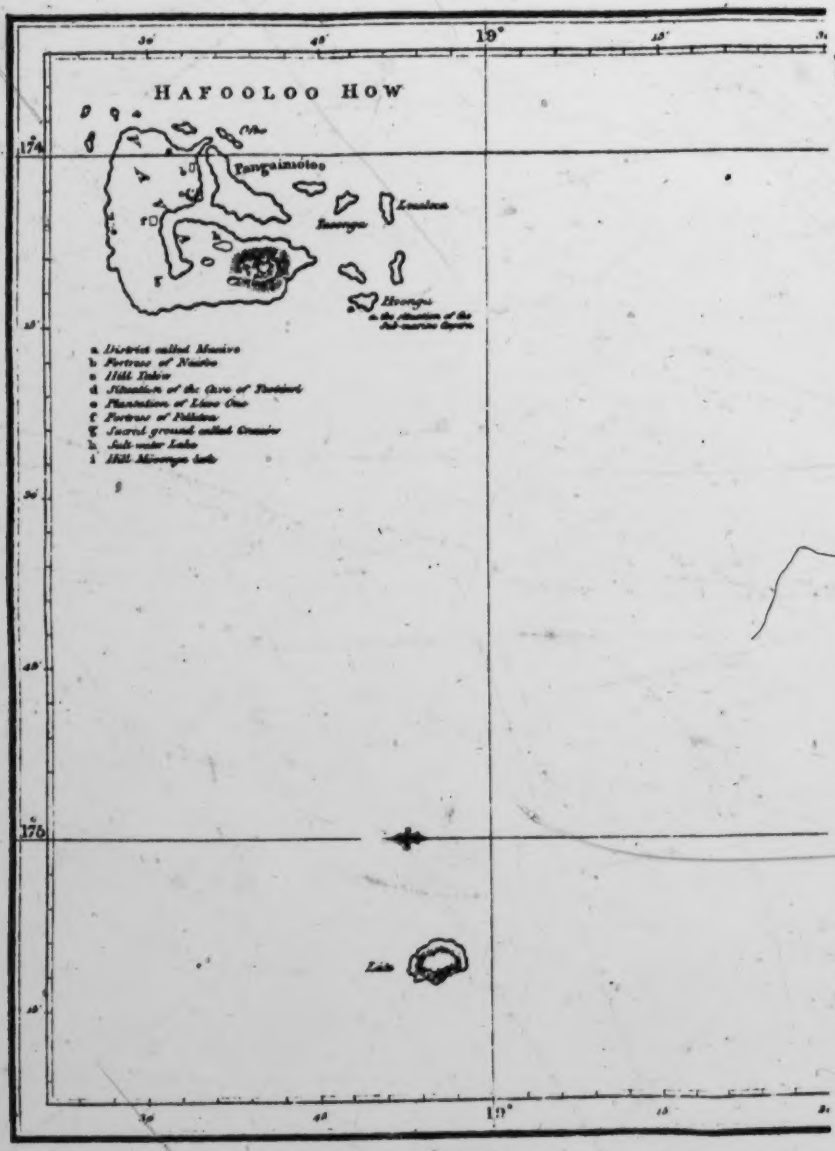
FIGURE 6.—Hereditary lands of nobles in Tongatabu.

2: Mariner F-5 (1806-1810) 1818 OU9 Tonga OU9



102
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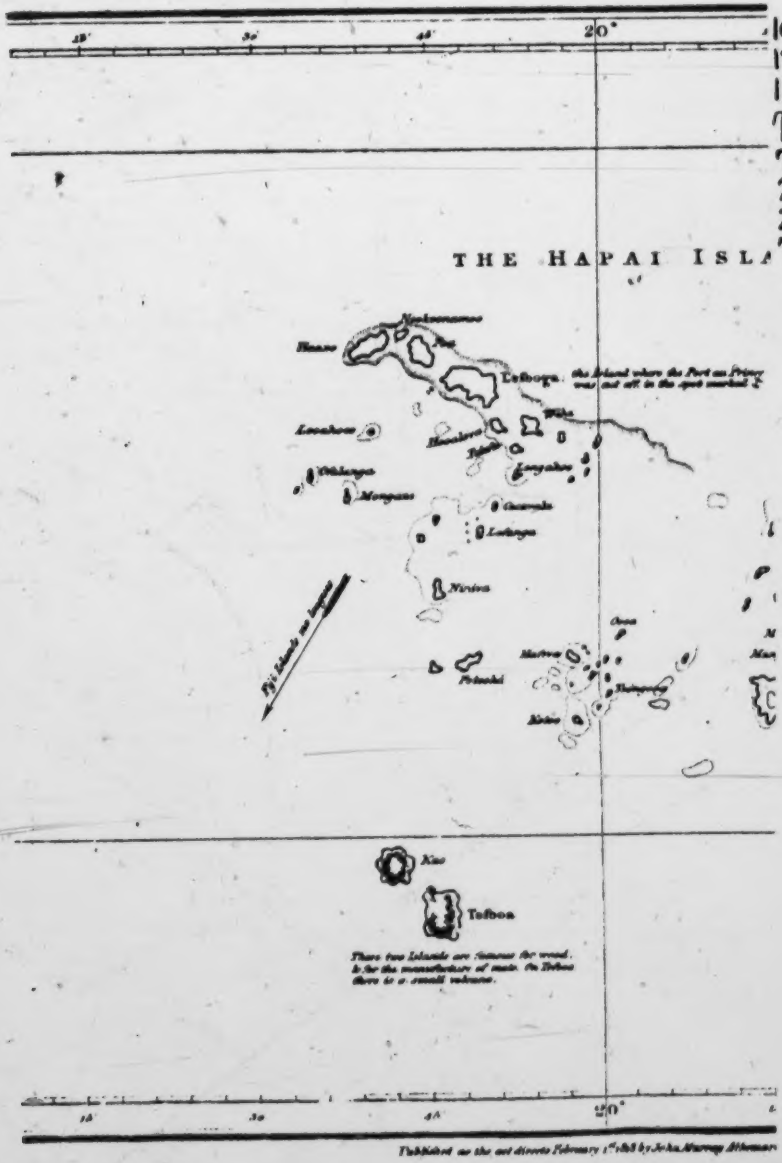
721

[FACING p. 1-A]

2: Mariner F-5 (1806-1810) 1818 OU9 Tonga OU9


THE HAPAI ISLA
Lefooga
Nomuka
Kao
Tofoa
Tofoa two Islands are famous for wood, & for the manufacture of mats. On Tofoa there is a small volcano.

102
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712
778
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721

[FACING p. 1-B]

2: Mariner F-5 (1806-1810) 1818 OU9 Tonga OU9

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712
778
241
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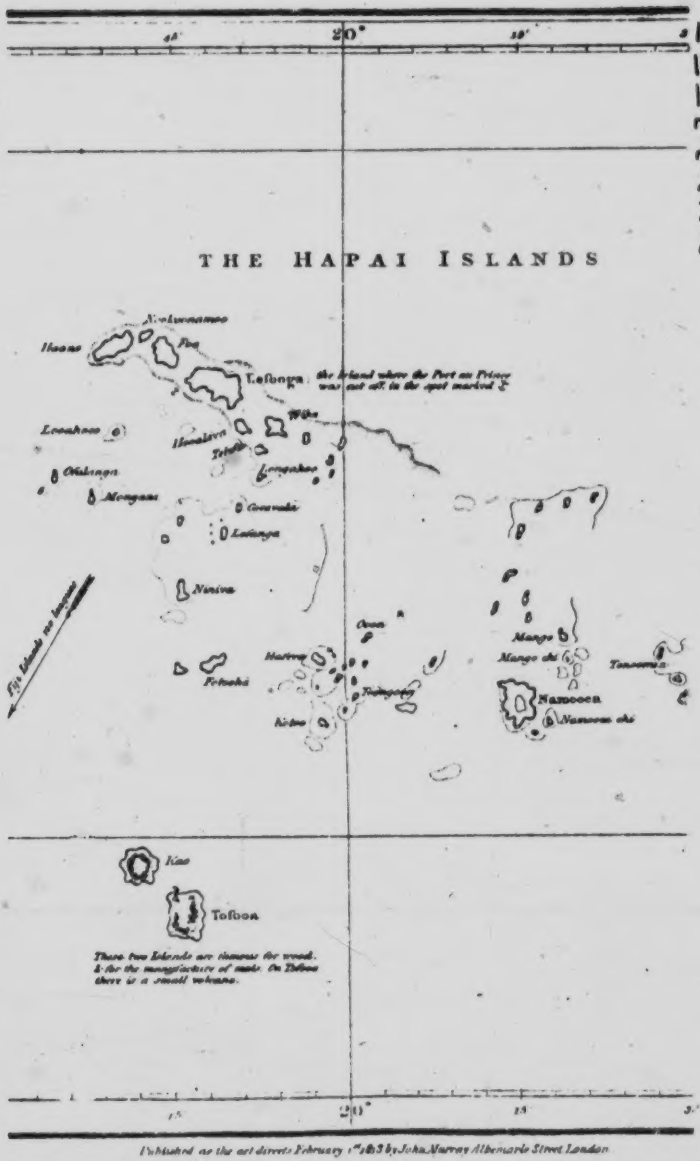
721



Published as the act directs February 1st 1813 by John Murray Albemarle Street London

[FACING p. 1-C]

2: Mariner F-5 (1806-1810) 1818 OU9 Tonga OU9

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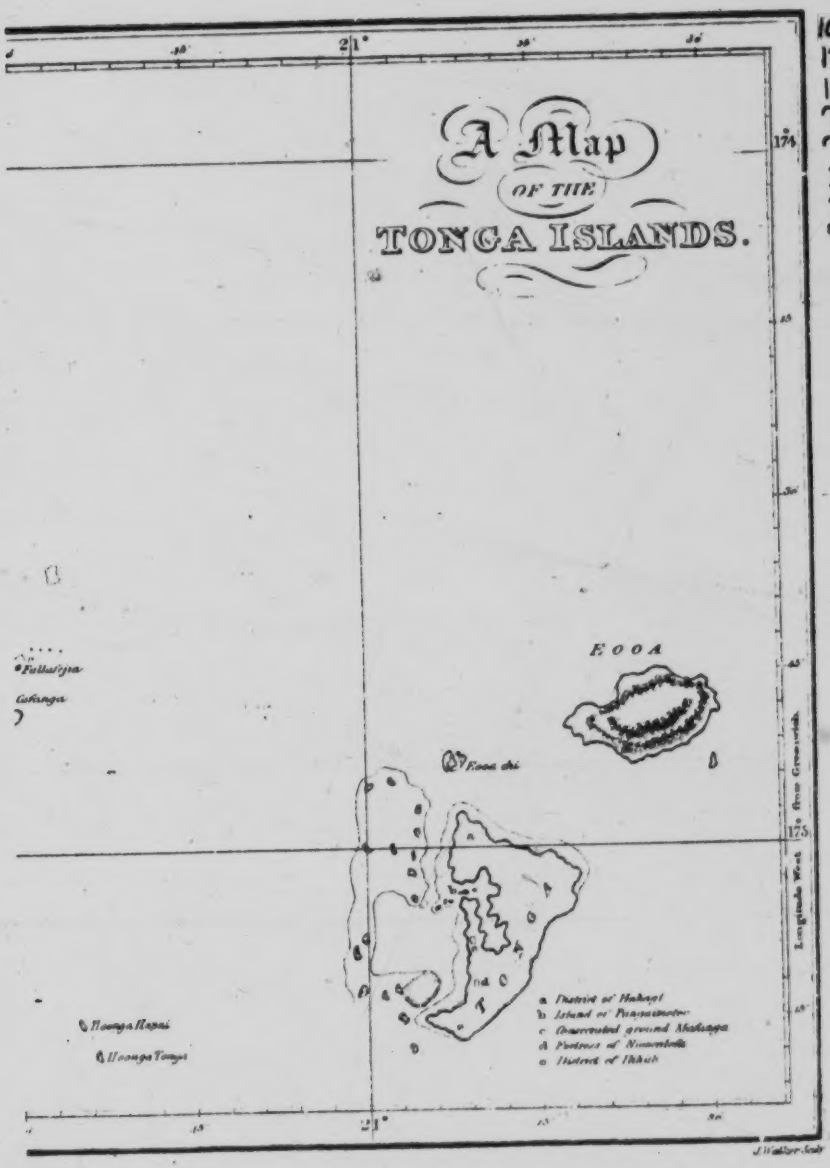
721



[FACING P1-D]

4: Gifford E-4,5 (1920-1921) 1923 OU9 Tonga OU9

REMARKS ON THE GAZETTEER

In compiling the list of Tongan place names, the following information, when available, is recorded: (1) the feature to which the name is applied; (2) the group of islands in which the feature occurs; (3) the island on which the place is located; (4) the village near which it is located; (5) the name of the landlord; (6) the meaning of the name; and (7) miscellaneous data.

FIGURE 1.—Outline map showing the villages of the Vavau group.

In the Gazetteer the largest number of names are of tracts (*api*) and village tracts (*apikolo*) and were obtained from the Tongan land office records. The tracts are the farm lands of the population, and each tract listed is today held by a Tongan tenant. Most of the tract names seem to be ancient. Not so the village tract names, many of which are of foreign countries; for village life in Tonga is only a century and a quarter old, the population formerly dwelling scattered over the land. Civil war,

102
361

FIGURE 2.—Out map showing the villages of the island of Tongatabu

7: McKern A-4,5 (1920-1921) 1929 OU9 Tonga OU9

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712
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172

Plan of Lapaha. (See figure 46.)

Lapaha proper:

a, fortification wall.
b, fortification moat.
c, gateway.
d, Olotele, enclosure and house of the Tui Tonga.
e, Tokomatupa, stone post.
f, house of Kautai.
g, malae of the Tui Tonga.
h, mound Takuilau.
i, malae Fanakava.
j, langis, royal tombs: 1, Tuoteau; 2, Tauatonga; 3, Katoa; 4, Tuofefafa; 5, Sinai; 6, Taetaea; 7, unnamed langi; 8, Taiaua; 9, Leka; 10, Tauhala; 11, Nukulau, a; 12, Nukulau, b; 13, unnamed langi; 14, unnamed langi; 15, Faapite; 16, Maluatonga; 17, Puipui; 18, Nakulukilangi; 19, Langalangafehi; 20, Paepaeotelea; 21, Namoala; 22, unnamed *faitoka*.

Moalunga:

k, Fonuamotu, dwelling of the Tui Haatakalaua.
l, Nukukausiala.
m, Falesinifu of the Tui Haatakalaua.
n, cohabital house.
o, *faitoka* for wives of the Tui Haatakalaua.
p, Falekili.
q, well.
r, Vakaniua, anchorage island.
s, Tukumotofa, house of Lauaki.
t, Malama, bathing place.
u, house called Milo.

Loamanu, burial place of the Tui Haatakalaua: 1, Falepulemaalo; 2, Loamanu; 3, Faletuipapai; 4, cemetery of Luani; 5, stone wall; 6, house of Afu Haalaufuli, caretaker.

Tatakamotonga:

v, house of the Tui Kanokupolu.
w, Avaui, house of priest.
x, the house Matangipuomai.
y, Falehau, king's guest house.
z, the god-house Kikiloi.

7: McKern A-4,5 (1920-1921) 1929 - OU9 Tonga OU9

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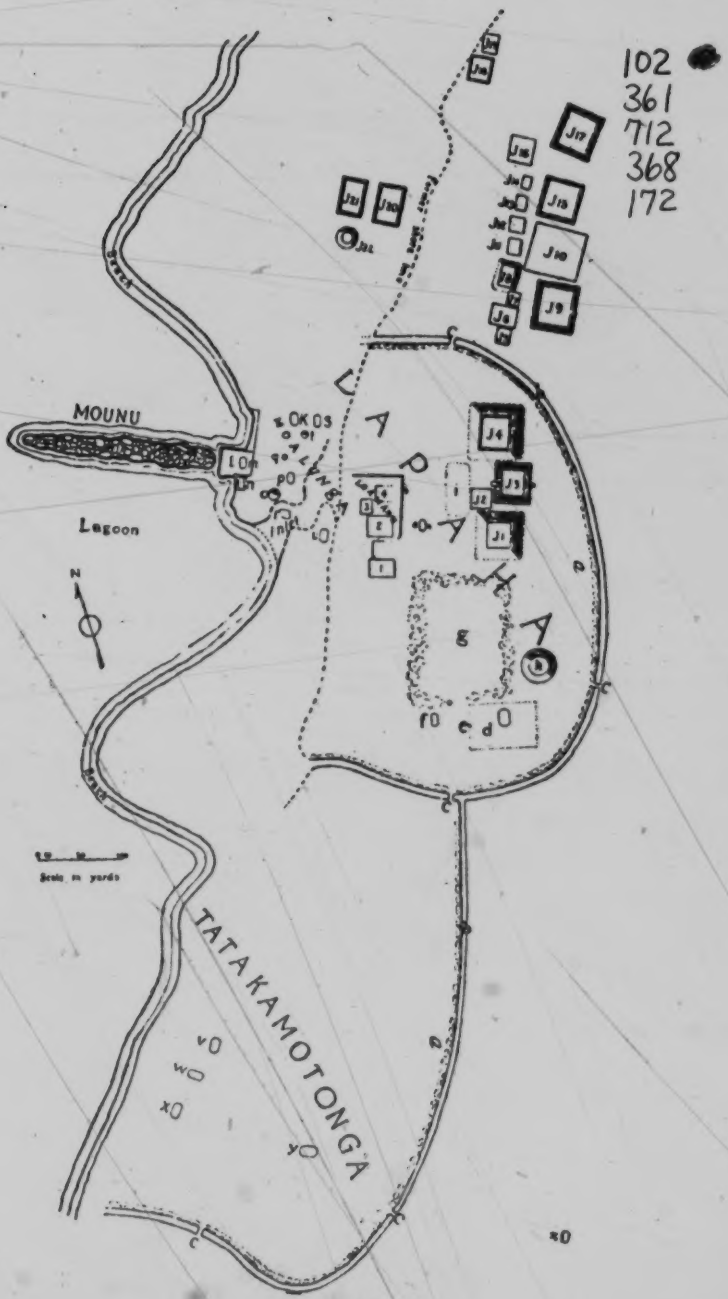
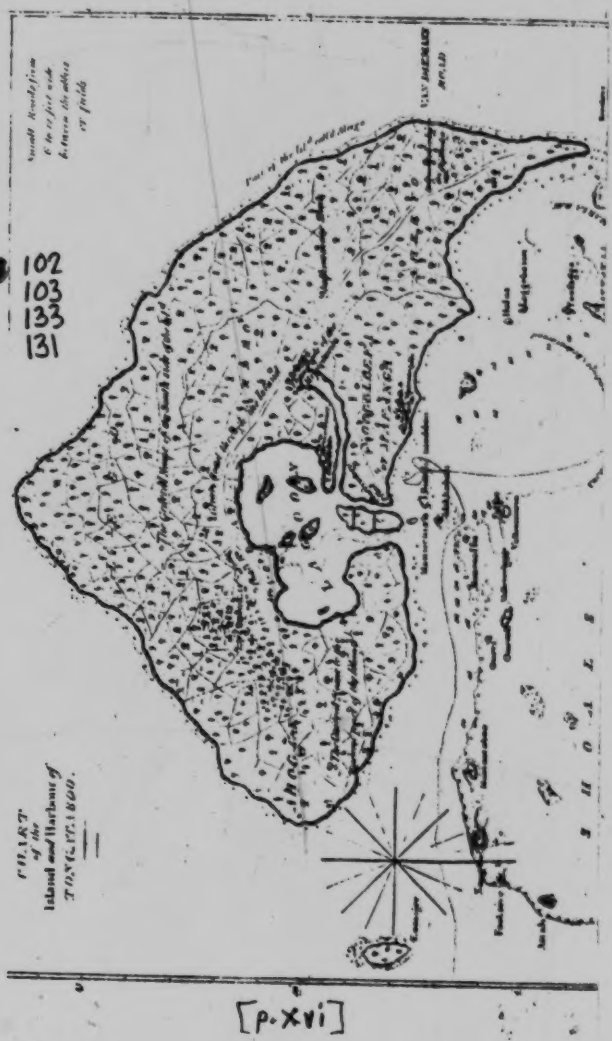


FIGURE 46.—Plan of Lapaha

12: Vason M-3 (1797-1801) 1810
0U9 Tonga 0U9



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[p.xvi]

13: Beaglehole & Beaglehole E-5 (1938-1939) 1941
OU9 Tonga OU9
Vavau
Pangai

102
361
133
491
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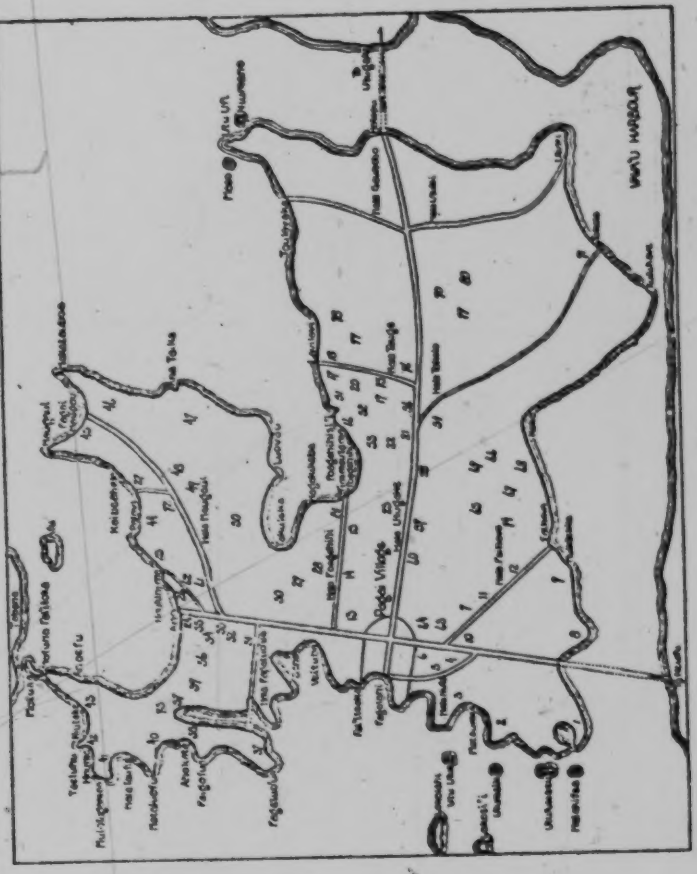

FIG. 1.
Sketch map of the island of Pangaimotu showing the location of Pangai village (here spelt Pagai), principal roads (*hala*) giving access to the plantations, together with main place names. Numbers indicate location of the plantations controlled by the villagers of Pangai.

14: Thomson G-3 (1886-1891) 1894
OU9 Tonga OU9

14: Thomson G-3 (1886-1891) 1894
OU9 Tonga OU9

102
131

[End Map-B]

19°

19°

Metis I.

Eshi

Ofolanga I.

Mangeme I.

Fakaʻhavai

Moui-tea

Nukunama I.

Kao I.

Toʻfua I.

HAAPAI GROUP

Nomuka I.

Mtama I.

Nugu-bulé

Fotua I.

Lofanga I.

Ihua manu I.

Hoʻeva I.

Longahau I.

Tataʻfa I.

Fuaʻ I.

Tofua I.

Nifuka I.

Uiha I.

KOTU GROUP

Kotu

Hafaiva I.

[End Map-C]

14: Thomson G-3 (1886-1891) 1894
OU9 Tonga OU9

102
131

14: Thomson G-3 (1886-1891) 1894
OU9 Tonga OU9

[End Map-D]

21: Simkin U-5 (no date) 1945 OU9 Tonga OU9

182 free education, free health services and traditional responsibilities for mutual aid makes an effective and long-established system of social security.

Natural Heritage

131 The hundred and fifty odd islands of the Kingdom of Tonga are scattered over a rectangle of the Pacific extending four hundred miles from north to south, their centre of gravity being near 20°S 173°W. Although they are spread over so much ocean their total area is less than 270 square miles, and all but thirty-six of them are either too small or too volcanic to be settled (Fig. 1).

102 361

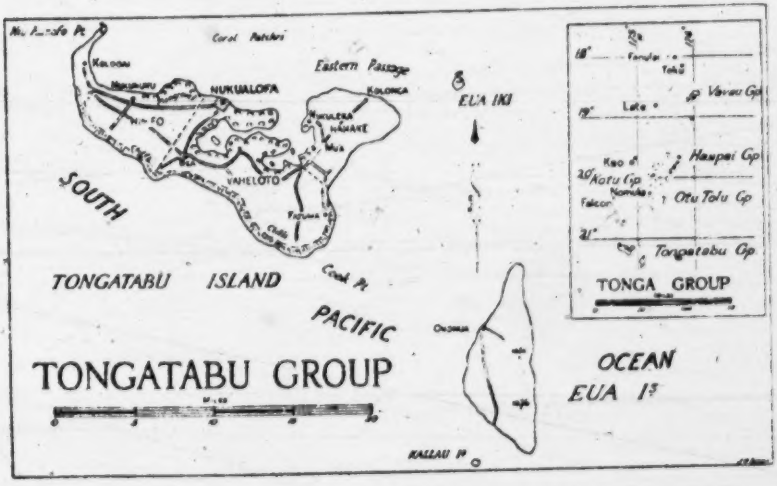

Fig. 1

133 Geologically they consist of two chains: a volcanic chain lying to the west of a line from Ata to Tafahi, and an eastern chain of coralline islands encircled by reefs. Despite their volcanic origin none of these islands reaches higher than Kao (which has a peak of 3,380 feet) and few of them have hills worth the name. Lakes and streams are equally 133 scarce. Tofua and Niua Fo'ou each has a fair-sized lake and there are 312 a number of creeks on Eua, but the other islands have to rely entirely upon wells and the storage of rain for their water. One reason for this 134 is that the soil is extremely porous, being a shallow layer of red volcanic ash, devoid of quartz, but containing broken-down particles of limestone. It is initially very fertile, but does not carry crops for long

22: West

OU9 Tonga OU9

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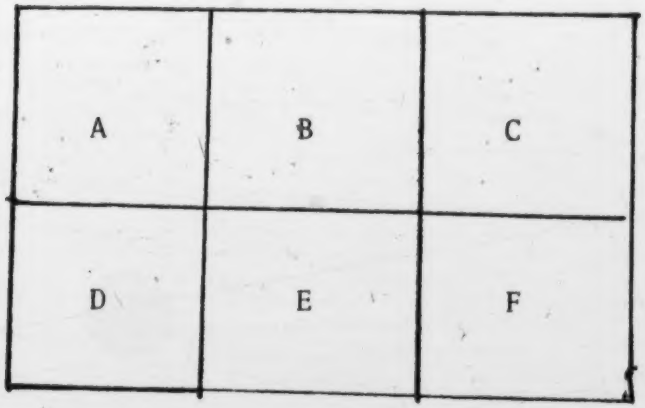

Chart of position of map following p. xv. [facing map]

102
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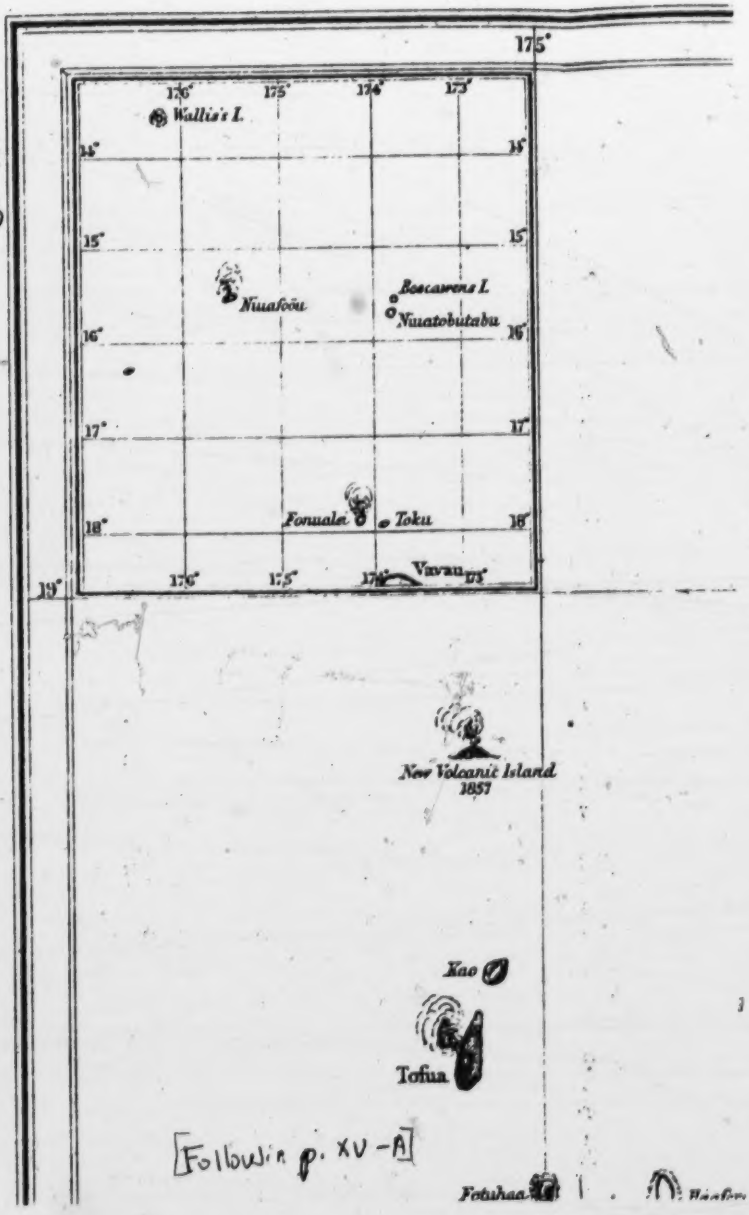
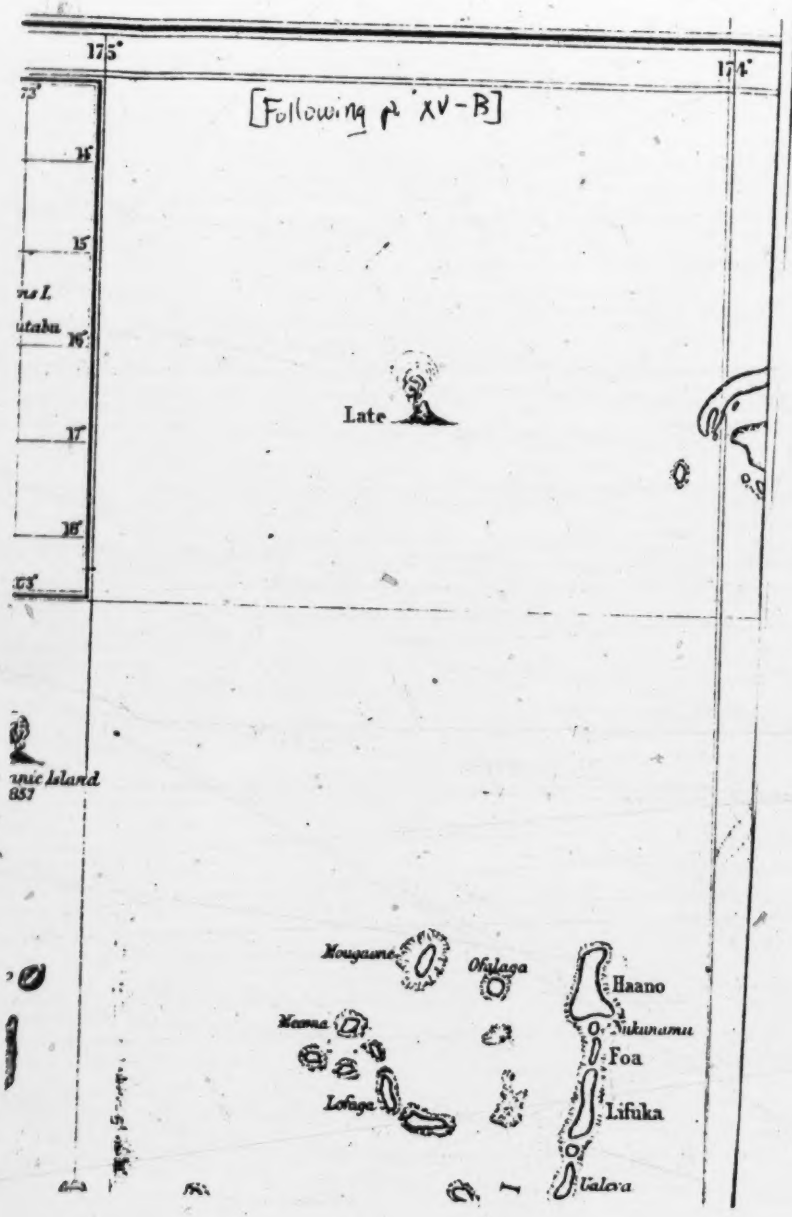


[Following p. XV-A]

22: West M-3 (1846-1855) 1865 OU9 Tonga OU9



102
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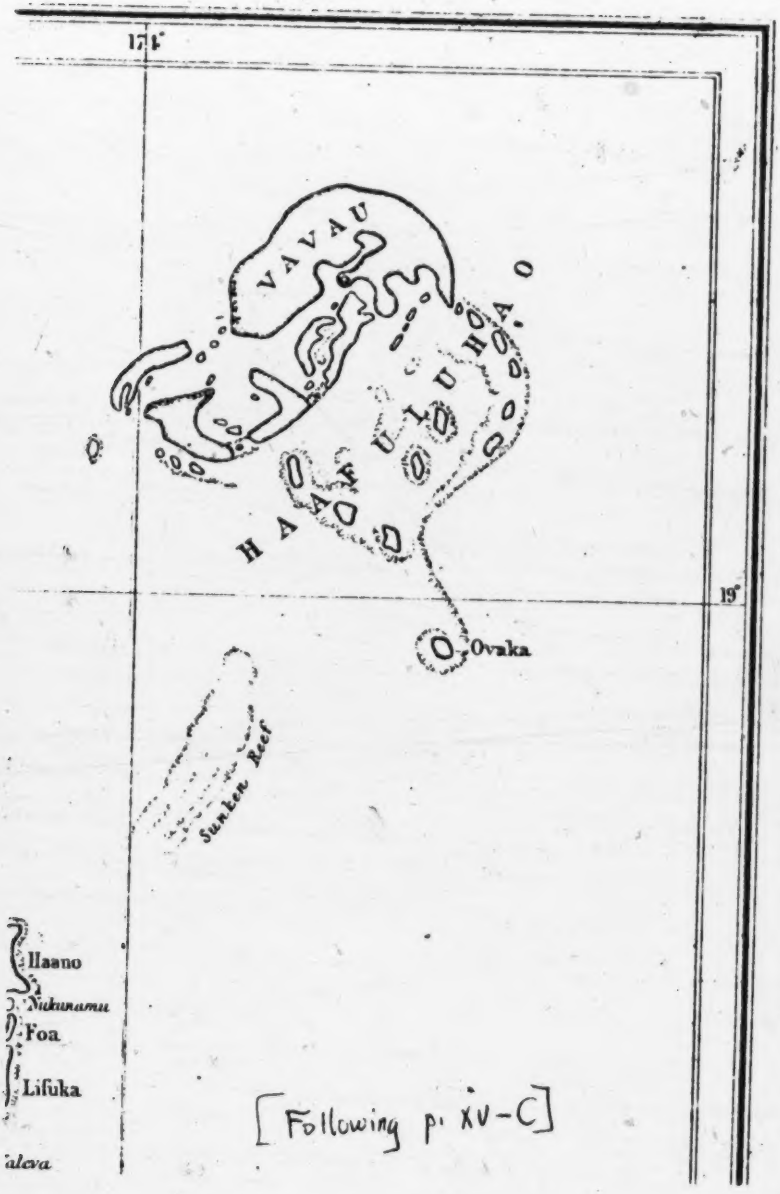

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[Following p. xv-C]

22: West M-3 (1846-1855) 1865 OU9 Tonga OU9

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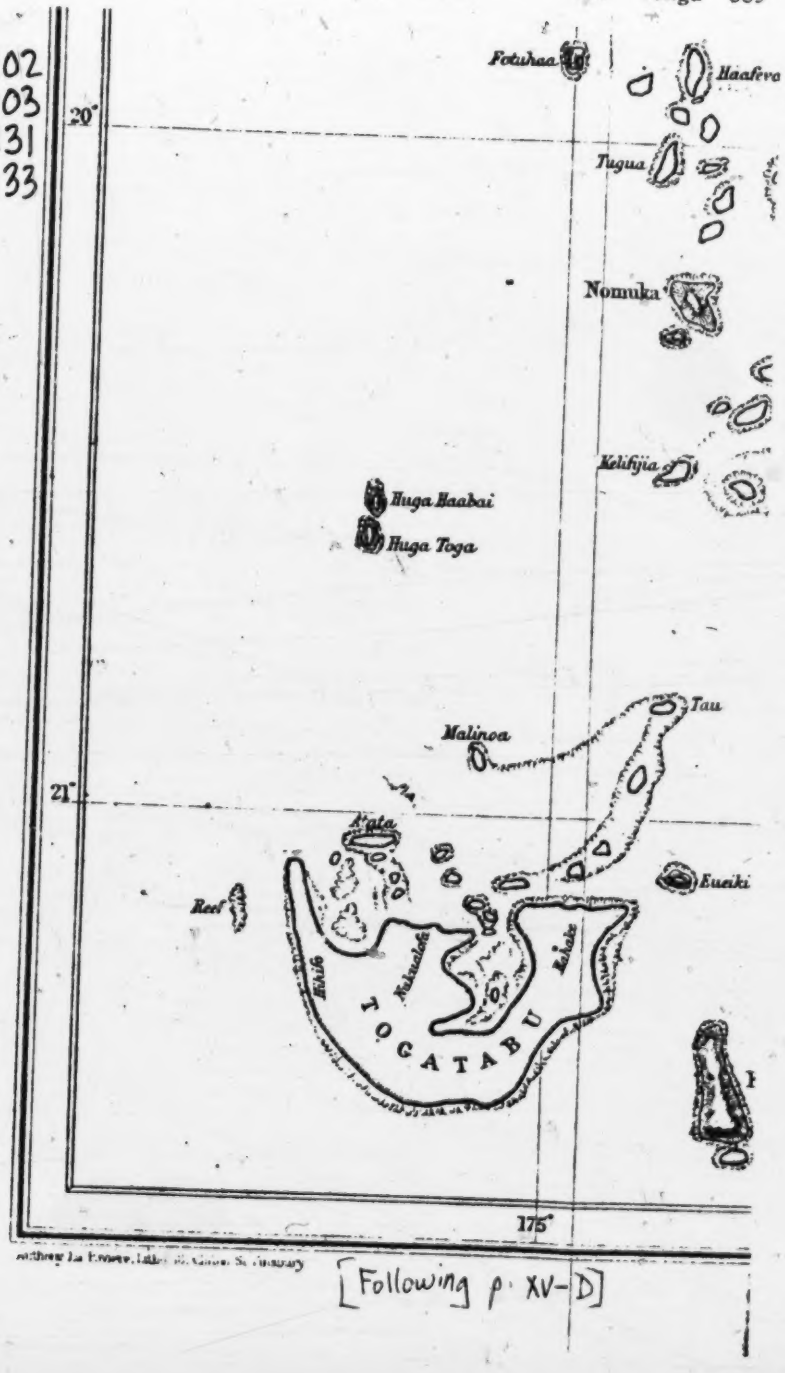
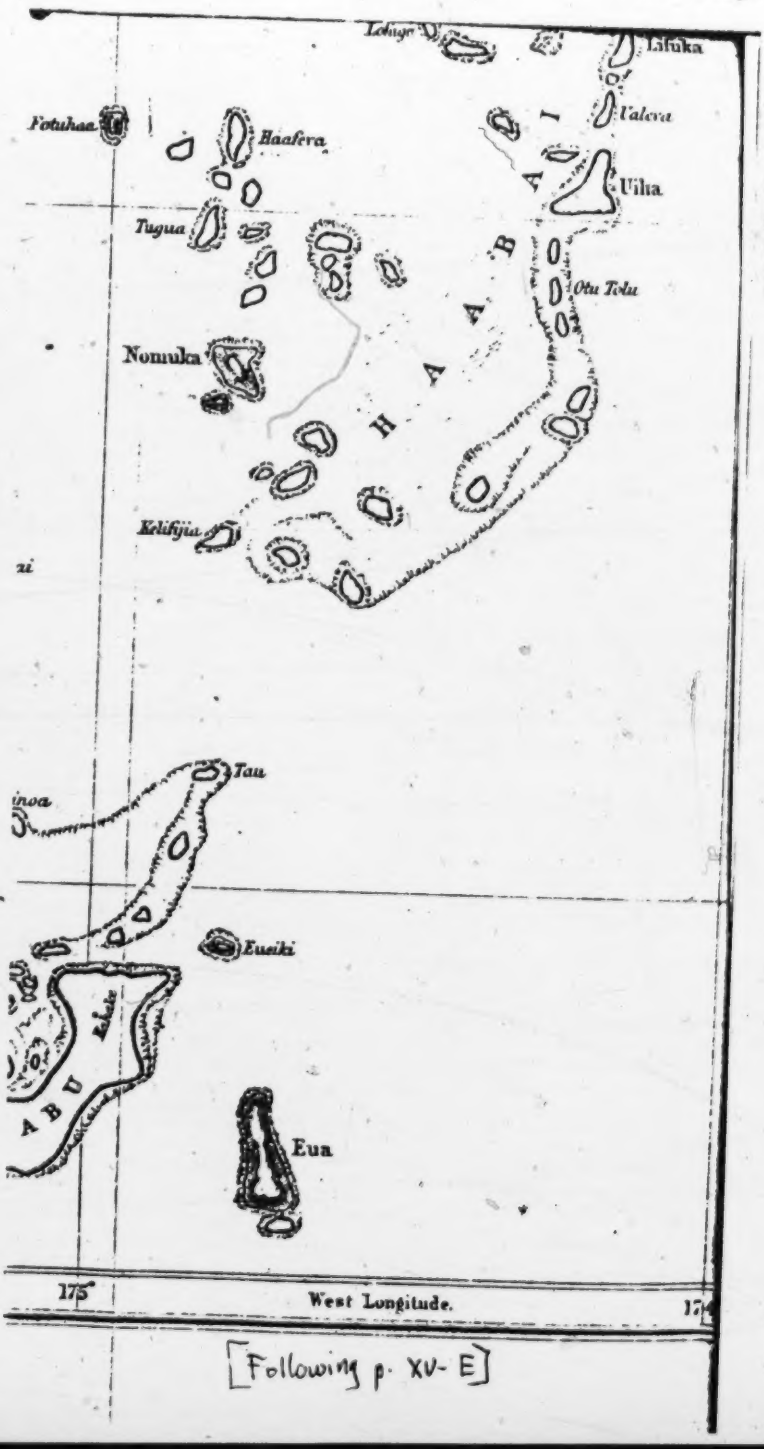


[Following p. XV-D]



102
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[Following p. XV- E]

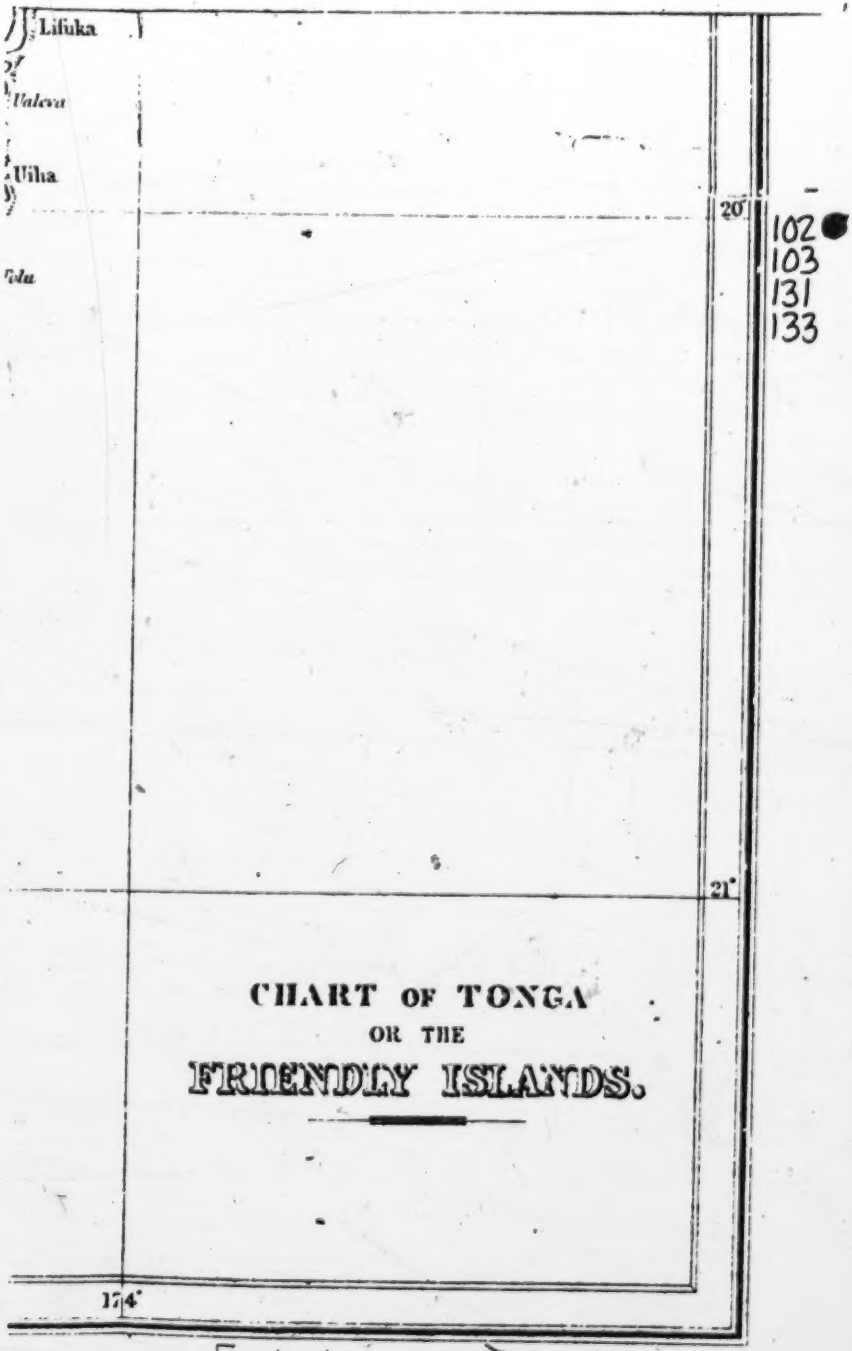

CHART OF TONGA
OR THE
FRIENDLY ISLANDS.

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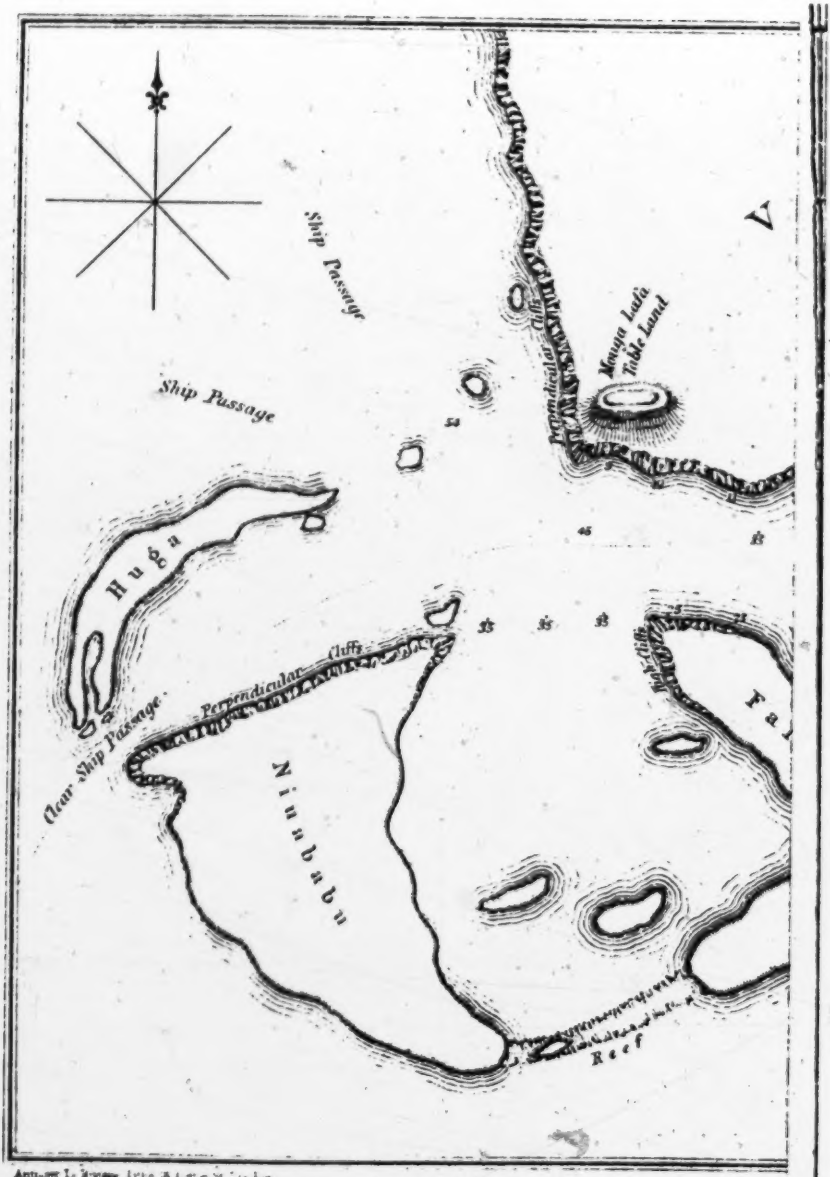
[Following p. XV-F]



102
131
133
487

[Facing p. 149-A]

22: West M-3 (1846-1855) 1865 OU9 Tonga OU9

102
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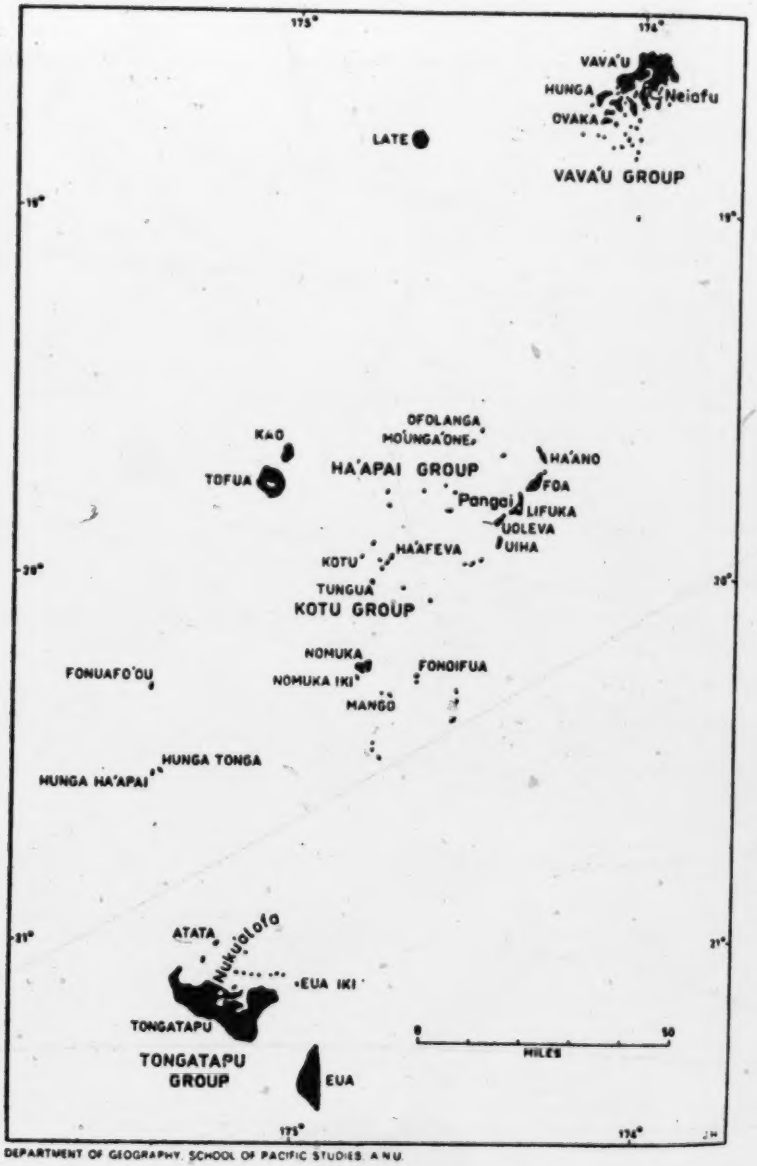
133
487

[facing p. 149-B]

29: Snow G,X-4 (no date) 1969 OU9 Tonga OU9

102



DEPARTMENT OF GEOGRAPHY, SCHOOL OF PACIFIC STUDIES, A.N.U.

[p.296]

31: Nayacakalou E-4,5 (1957-1958) 1959
0U9 Tonga 0U9

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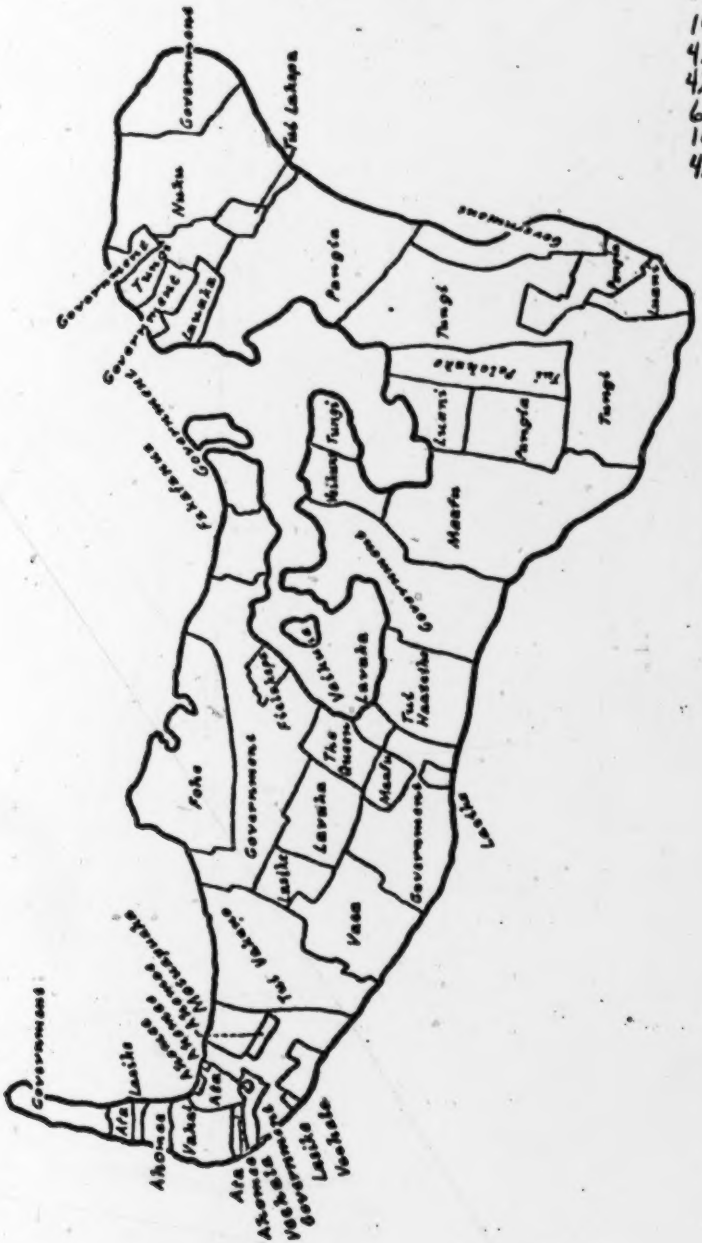
Government
Tui Lakeba
Nuku
Tongia
Tui Nayau
Lauthala
Government
Government
Tongia
Tongia
Tui Nayau
Lauthala
Tui Nayau
Tongia
Tongia
Tui Nayau
Lauthala
Tongia
Tui Nayau
Lauthala

39: Gerstle & Raitt C,Q-4,5 (1952-1972) 1974 OU9 Tonga OU9

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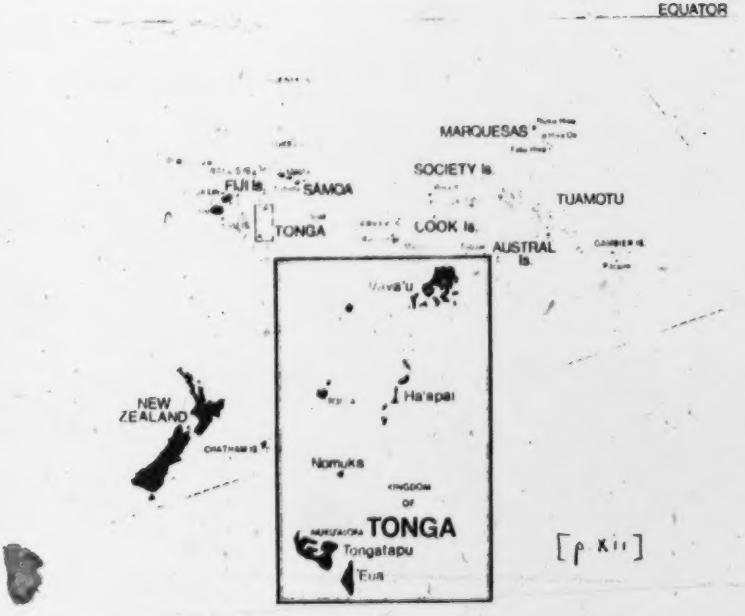
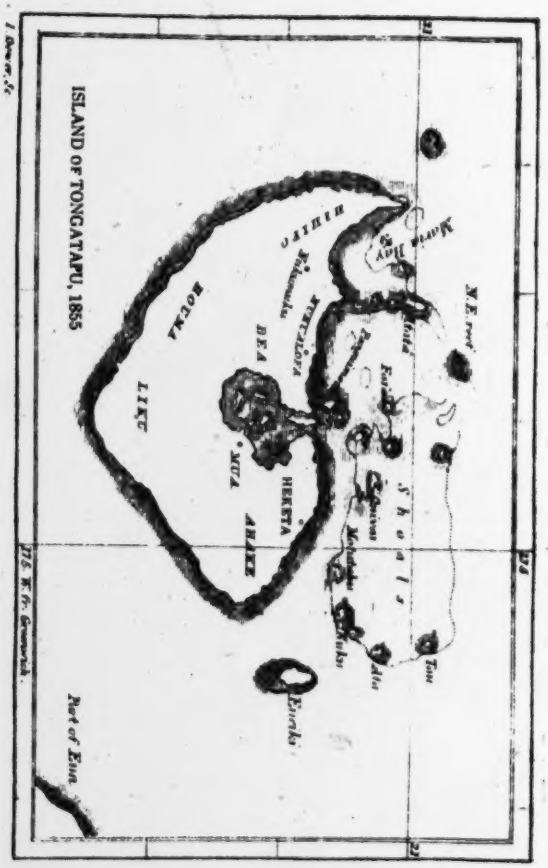
131

POLYNESIA



[p xii]

39: Gerstle & Raitt C,Q-4,5 (1952-1972) 1974 OU9 Tonga OU9


ISLAND OF TONGATAPU, 1855
Port of Eua
Eua
Tofua
Kotu
Tau
Eueiki
Shoals
Mariner's Rock
Middle Island
Pangaimotu
Nukuleka
Hihifo
Nukuhetulu
Mata Fonua
Fahefa
Kolovai
Mu'a
Hihifo
Nukuleka

39: Gefstle & Raitt C,Q-4,5 (1952-1972) 1974
009 Tonga 019

ILLUSTRATIONS

Page

vi "Boats of The Friendly Isles." Plate 43, betw. pp. 474 & 475 in George Wm. Anderson, *A New, Authentic, & Complete Collection . . .*

x [Seal of Tonga.] Adapted from the original by Nick Rott.

xii [Map of Polynesia and Tonga.] Artist: Nick Rott. Adapted from Poignant, *Oceanic Mythology* pp. 20-21, and *National Geographic* March, 1968 p. 328.

2-3 "Pirogues des Iles des Amis." French reproduction of "Boats of the Friendly Isles." Artist: Wm. Hodges. Plate 42, betw. pp. 18 & 19 in Vol. II, James Cook, *A voyage towards the South Pole . . .*

4 "Vue d'Un Hangar abritant la pirogue de guerre du Chef Palou." Artist: de Sainson. Plate 74 in Dumont d'Urville, *Atlas–Partie Historique: Voyage de la Corvette "L'Astrolabe"* . . .

12 *Top*: "Costume de guerre." Artist: de Sainson. Plate 72 in Dumont d'Urville, *Atlas–Partie Historique: Voyage de la Corvette "L'Astrolabe"* . . .

13 "Woman of the Friendly Islands." Artist: Piron. Plate 30, betw. pp. 168 & 169 in Vol. II, J.J.H. de Labillardiere, *Voyage in Search of La Perouse . . .*

14 "Vue Interieure de la Maison des Femmes du Chef Palou." Artist: de Sainson. Plate 73 in Dumont d'Urville, *Atlas–Partie Historique: Voyage de la Corvette "L'Astrolabe"* . .

27 "Map of Tonga." Betw. pp. 150 & 151 in Sarah S. Farmer, *Tonga and the Friendly Islands.*

28 "Portrait of Poulaho, King of the Friendly Islands." Artist: J. Webber. Plate 3, facing p. 454 in George Wm. Anderson, *A New, Authentic, & Complete Collection . . .*

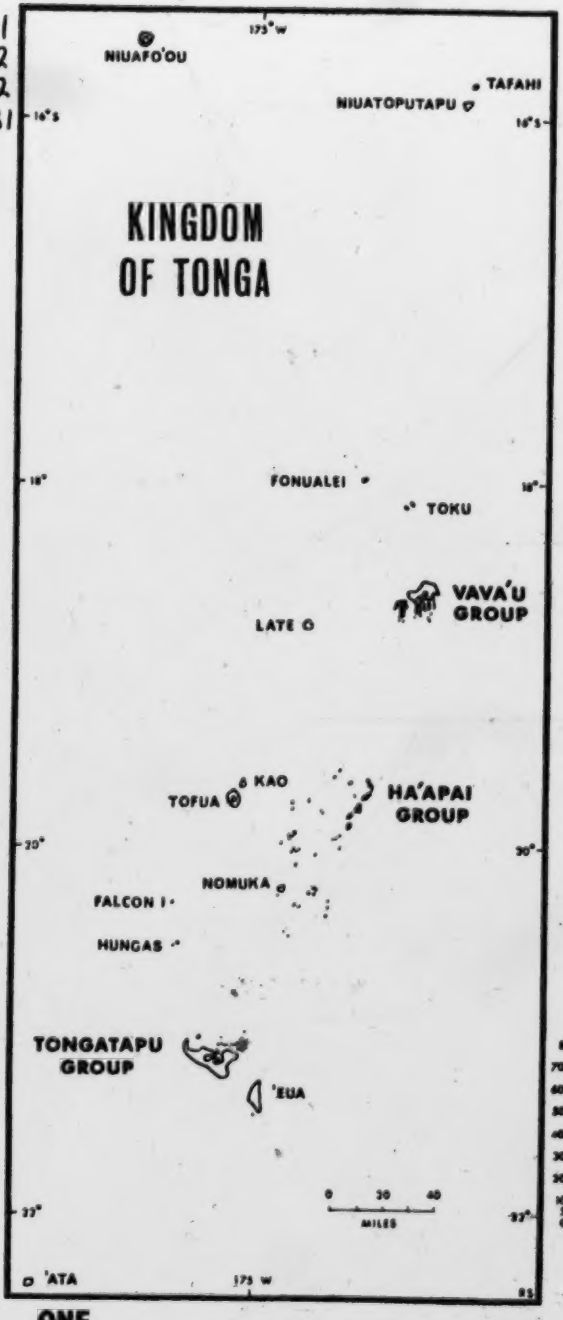
29 "The Natche, a Ceremony in Honour of the King's Son, in Tongataboo." Artist: J. Webber. Plate 42, facing p. 466 in George Wm. Anderson, *A New, Authentic, & Complete Collection*

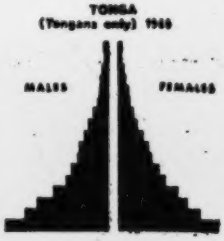
30 "Vue de l'un des Monumens destines a la Sepulture de la Race Royale." Artist: de Sainson. Plate 95 in Dumont d'Urville, *Atlas–Partie Historique: Voyage de la Corvette "L'Astrolabe"*

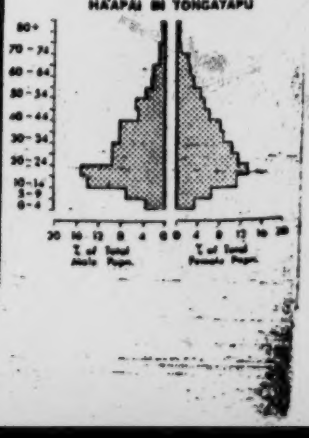
31 *Top*: "Tombeaux des Chefs." Artist: de Sainson. Plate 101 in Dumont d'Urville, *Atlas–Partie Historique: Voyage de la Corvette "L'Astrolabe"* . . . The following is a list (the reader may be interested in comparing this information with that reported by McKern in 1929) of those who were supposedly buried in each respective *langi*, indicated by numbers on the map, as reported in 1827 to the members of this French exploring voyage:

1. A *Tu'i Tonga* named Fatafehi.
2. Five Kings.
3. A King and his wife.
4. A child.
5. A King.
6. Four Kings.
7. A King.
8. Kings named Tu'ipulotu & Fatafehi, plus two others.
9. Four Kings.

161
162
102
131







ONE

42: Walsh K-4,5 (no date) 1970 OU9 Tonga OU9

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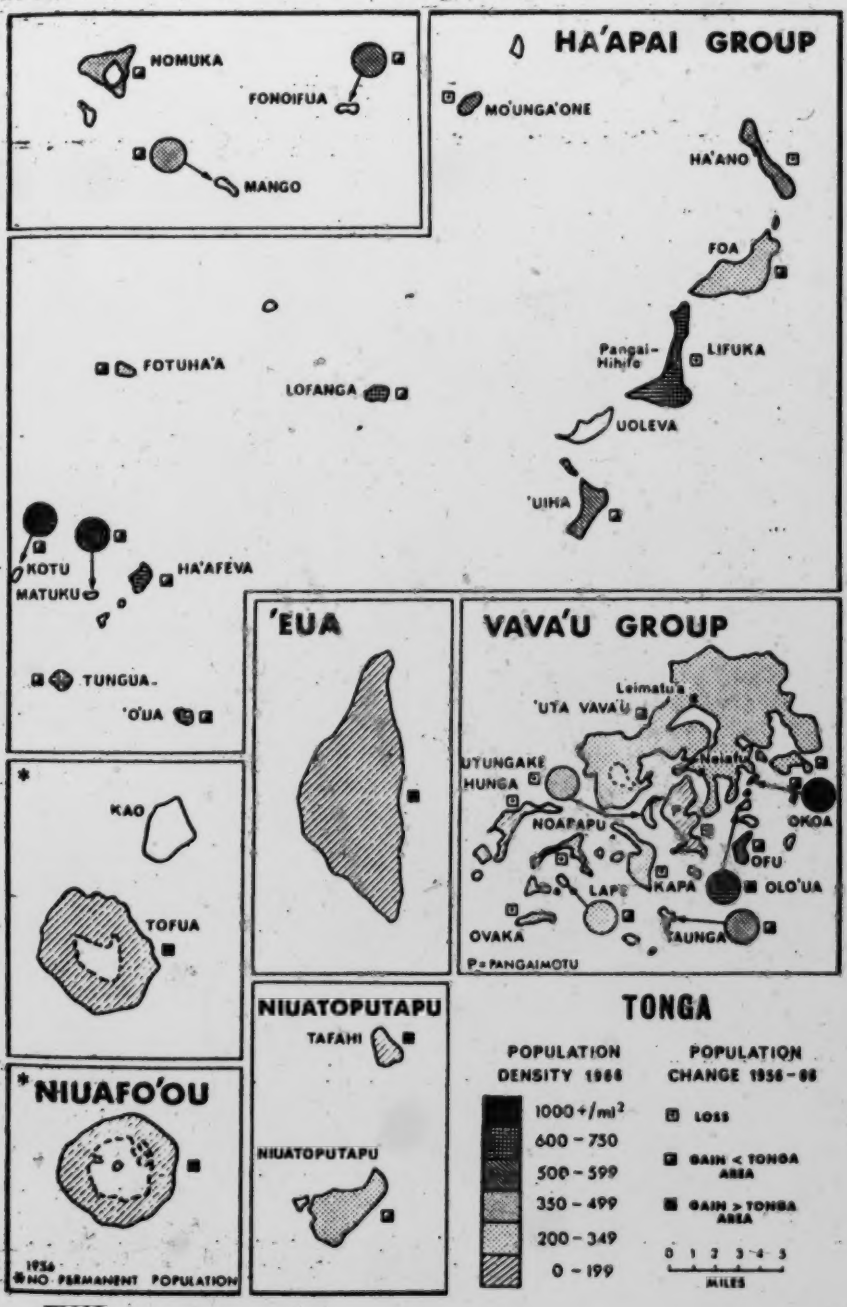
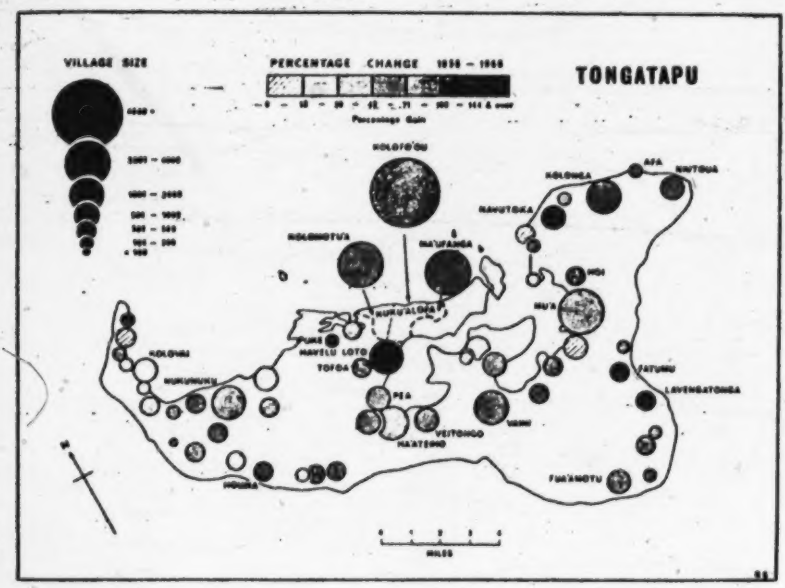
162
166



42: Walsh K-4,5 (no date) 1970 OU9 Tonga OU9



161
162
166
361
[102]

THREE

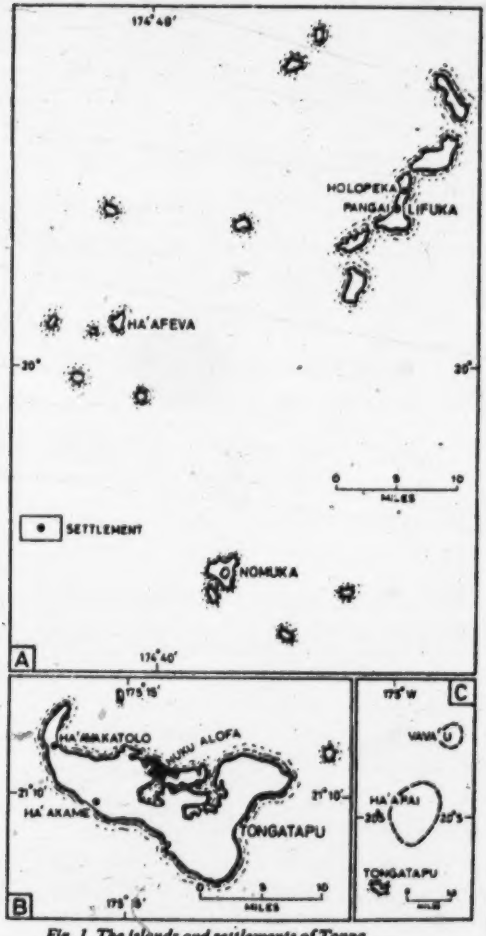
cards and from fieldwork undertaken in 1963-4. They relate to movement from other parts of Tongatapu, and from the northern island groups of Ha'apai and Vava'u which together accounted for almost all the town's migrant population at that date.[20] [127] [101]

Urban Movement—1956

Movement to Nuku'alofa from other parts of Tongatapu was more significant in terms of numbers than movement from the other islands, but it mainly involved young people, especially college girls, and women, many of whom had married into local families. For this reason it is thought to have fewer social and economic implications than migration from outside Tongatapu. There did, however, seem to be a more normal migratory pattern from the more densely populated west of the island. This area was, and still is, the slowest growing, and the proportion of migrants in the school age group was less than elsewhere. The area also has long-standing cultural ties with Nuku'alofa through mutual association with the *tu'i kanokupolu* title which appears likely to have influenced migration in the past and initiated a pattern of chain migration which still continues today.

[20] Much of the following section is based on Walsh (1969a).

70 inches at Pangai (Ha'apai) and 86 inches at Neiafu (Vava'u). December to March tend to be the 132

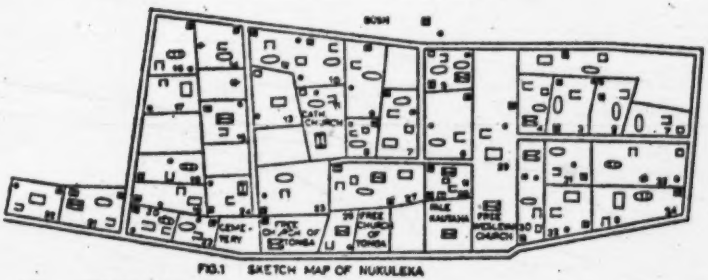


102
131
361

Fig. 1. The islands and settlements of Tonga
A. The Ha'apai group
B. Tongatapu
C. The relative location of the main island groups.

[p. 57-B]

MACHIKO AOYAGI



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361

FIG.1 SKETCH MAP OF NUKULEKA

1-34 HOUSEHOLD NUMBERS
34,35 LIVES IN THE BUSH NEAR THE VILLAGE

PALEHOME
- EUROPEAN STYLE HOUSE
- TRADITIONAL TONGA STYLE HOUSE
- SEMI-TRADITIONAL TONGA STYLE HOUSE
- FIJIAN STYLE HOUSE
- PALEAU OR FALEKAU

PALEKAUAU
- MADE OF WOOD OR CEMENT
- MADE OF COCONUT LEAVES
- PALEMALOLO
- OTHER BUILDINGS
- COCONUT OVEN
- RETAIL STORE
- WELL WATER

As is shown in the table, the two generation household is the dominant style. Out of 33 households, 28 consist of one married couple, 4, two married couples and one has no married pair. This last household consists of the town officer with one of his sons. His wife and small children live at Mu'aa where he received another *api tukuhau* recently. He intends to go back to Mu'a to join his family after retiring. Three out of the four households with two couples living together consist of couples of parents and children and the other a pair of married brothers. 592

From the fact that the large majority of the households include two generations and one married couple, it can be inferred that the household is formed primarily on the basis of the nuclear family. In fact, 21 households respectively are nuclear families and the rest include additional members. The households may be classified roughly into four groups on the basis of the sort of kin that they contain: 592 594

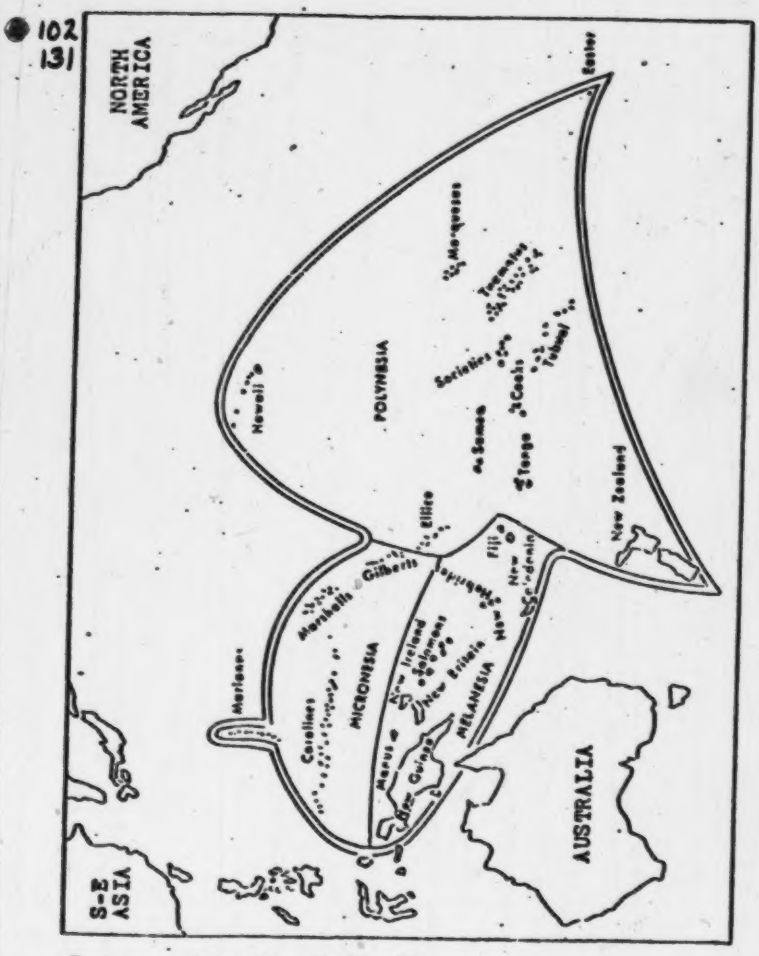
A. 21 households that contain only a nuclear family
   - a man, his wife and children (including adopted ones) — 19
   - a man and his wife — 1
   - a man and his son — 1

B. 8 households that contain a nuclear family plus additional kinsfolk of male side 592 594
   - A plus husband's mother — 2 596
   - A plus husband's father and sister — 1
   - A plus husband's brothers — 1
   - A plus husband's brother and his wife with children — 1
   - A plus son and his wife with children — 2
   - A plus a boy who is remotely related to husband — 1

C. 3 households that contain a nuclear family plus additional kinsfolk of female side
   - A plus daughter and her husband with children — 1
   - A plus daughter who is divorced and her daughter — 1
   - A plus wife's mother and a boy who is remotely related to wife 1

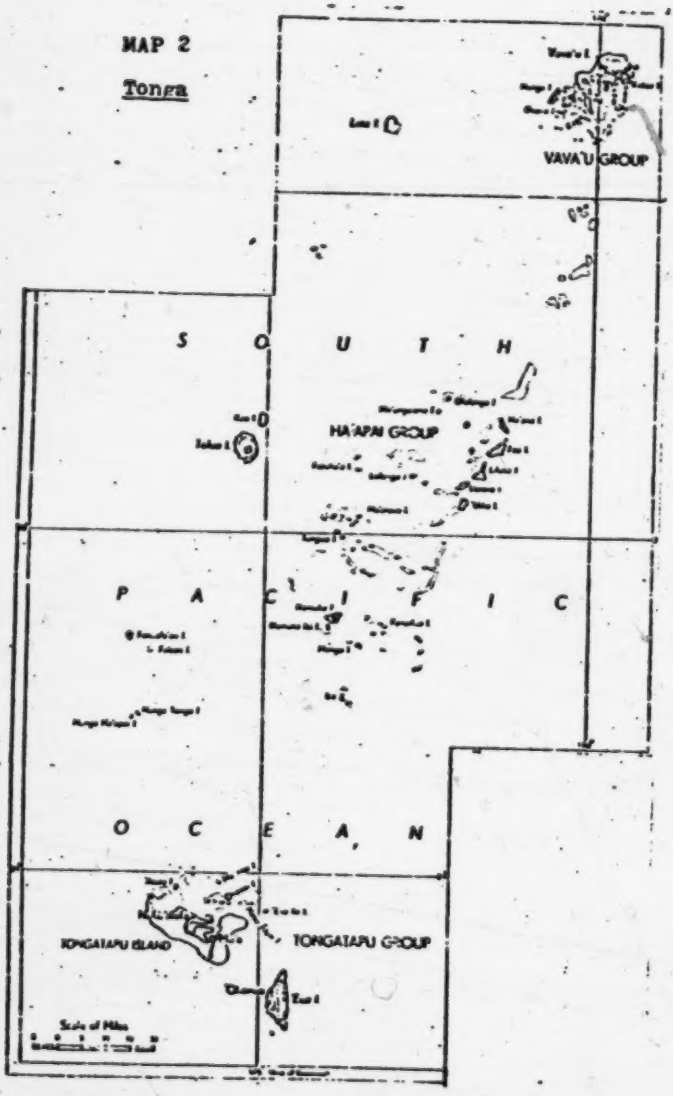
46: Decktor Korn E-5 (1969-1970) 1978 OU9 Tonga OU9
Tongatapu
Motulahi

MAP 1. Oceania



Source: Valentine 1963: 48.

46: Decktor Korn E-5 (1969-1970) 1978 OU9 Tonga OU9
Tongatapu
Motulahi



102
131

Source: Adapted from the end-map in Tonga: Report for the years 1962 and 1963 (Great Britain 1965).

46: Decktor Korn E-5 (1969-1970) 1978 OU9 Tonga OU9
Tongatapu
Motulahi

MAP 3

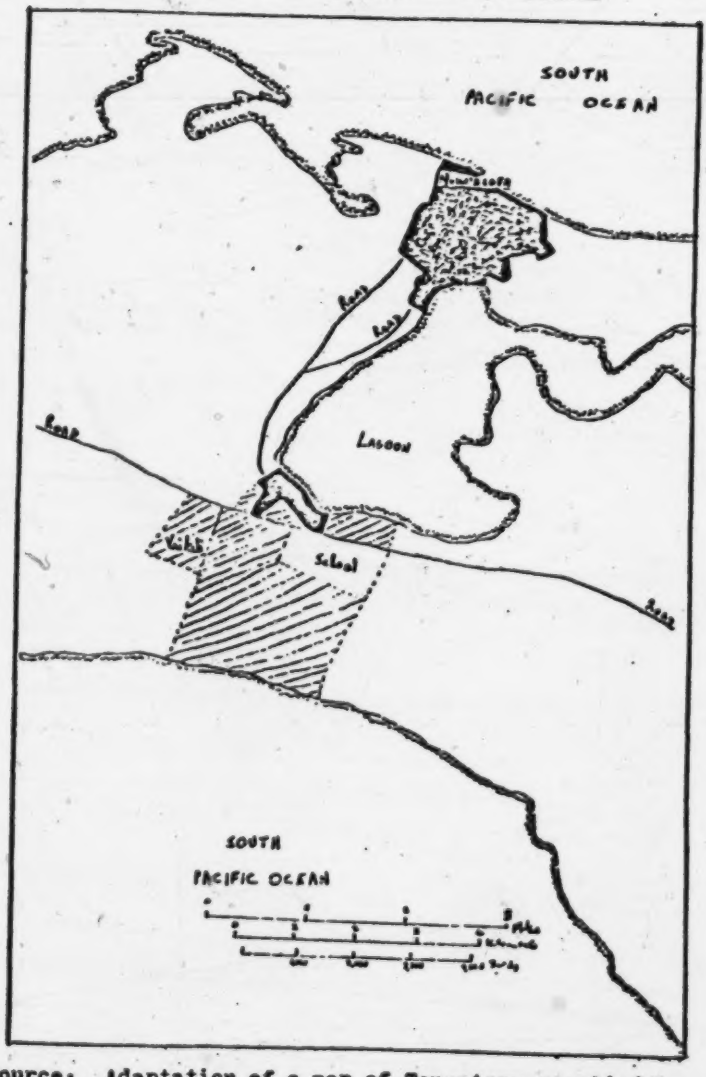
Tongatapu Island

102
361

Source: Adaptation of end-map in the Program for the Visit of Her Majesty Queen Elizabeth II . . . 1970 (Government of Tonga 1970b).

46: Decktor Korn E-5 (1969-1970) 1978 OU9 Tonga OU9
Tongatapu
Motulahi

MAP 4. Central Section of Tongatapu



102
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491
133
368

Source: Adaptation of a map of Tongatapu supplied by the Tonga Department of Lands and Surveys.

46: Decktor Korn E-5 (1969-1970) 1978 OU9 Tonga OU9
Tongatapu
Motulahi

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391
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MAP 5. Residential Sector of Motulahi

Source: Adaptation of various maps supplied by the Tonga Department of Lands and Surveys, supplemented by fieldwork observations.

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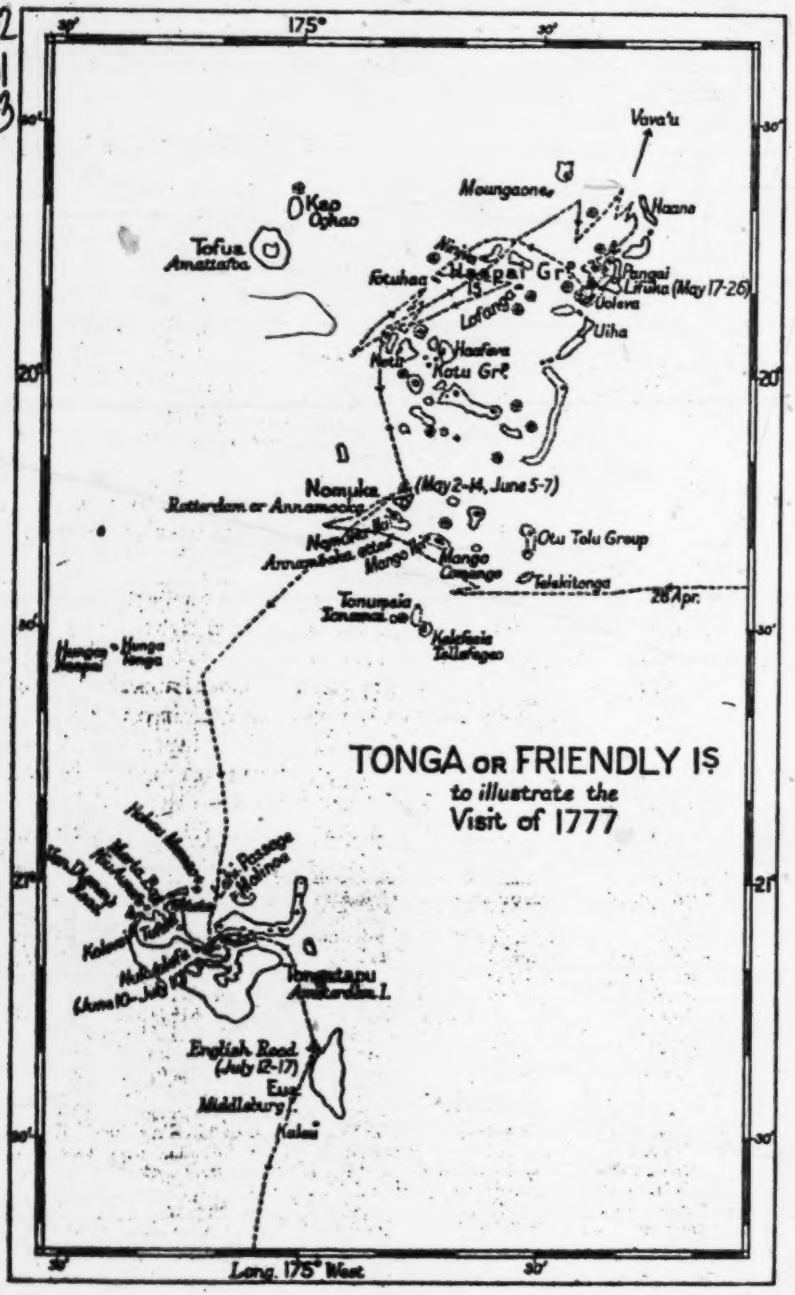

FIG. 5.

[p.104]

54: Cook G,T-5 (1777) 1967 OU9 Tonga OU9

FIG. 6

[p. 126]

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Figure 2.1. Map of Polynesia
Drawn by Edwin H. Bryan, Jr.

61: Kaeppler E-5 (1964-1967) 1977 OU9 Tonga OU9

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Figure 2.2. Map of Tonga
Drawn by Edwin H. Bryan, Jr.

TONGATAPU : LAND UNIT

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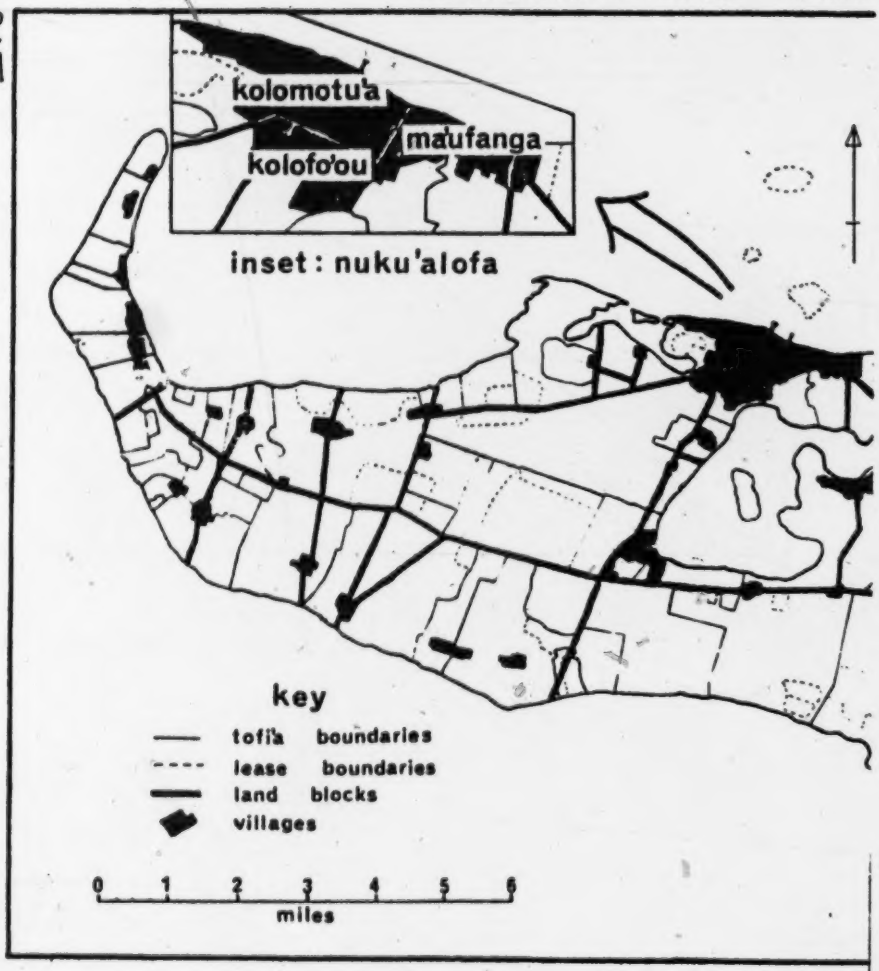

[p.89-A]

Fig. 1

66: Walsh K-5 (1963-1964) 1969 OU9 Tonga OU9
Nuku'alofa

J : LAND UNITS & VILLAGES

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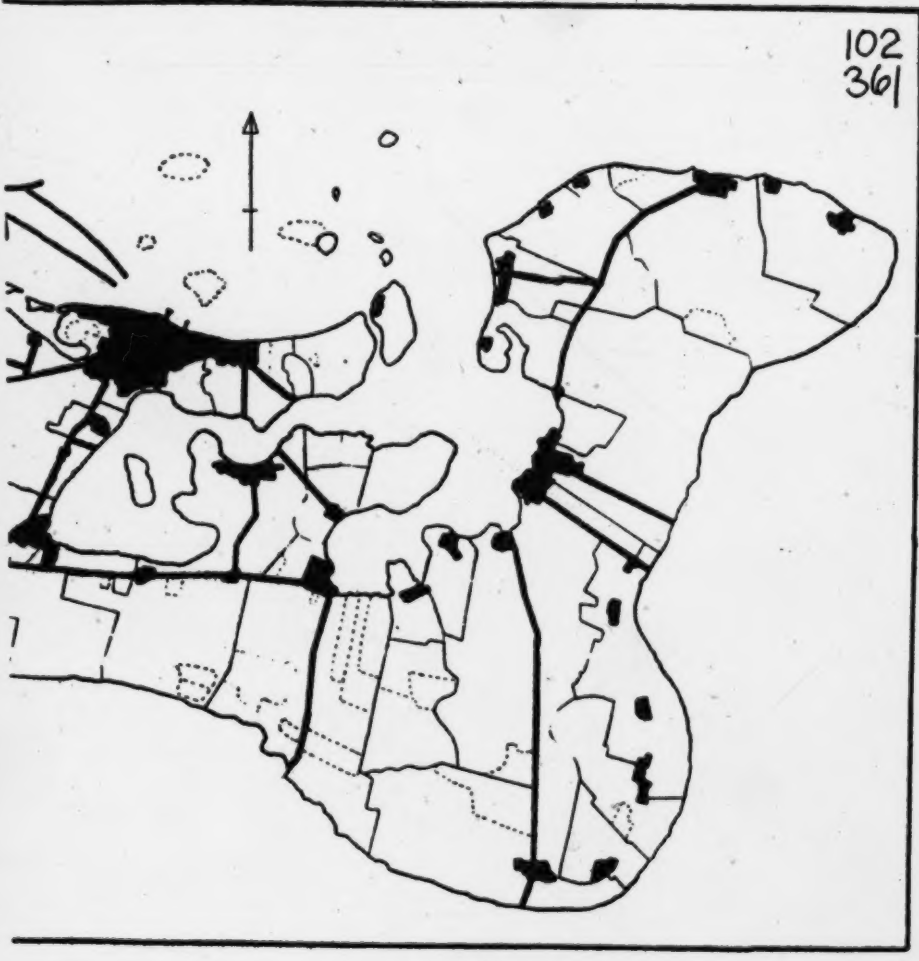

Fig. 1

[p.89-B]

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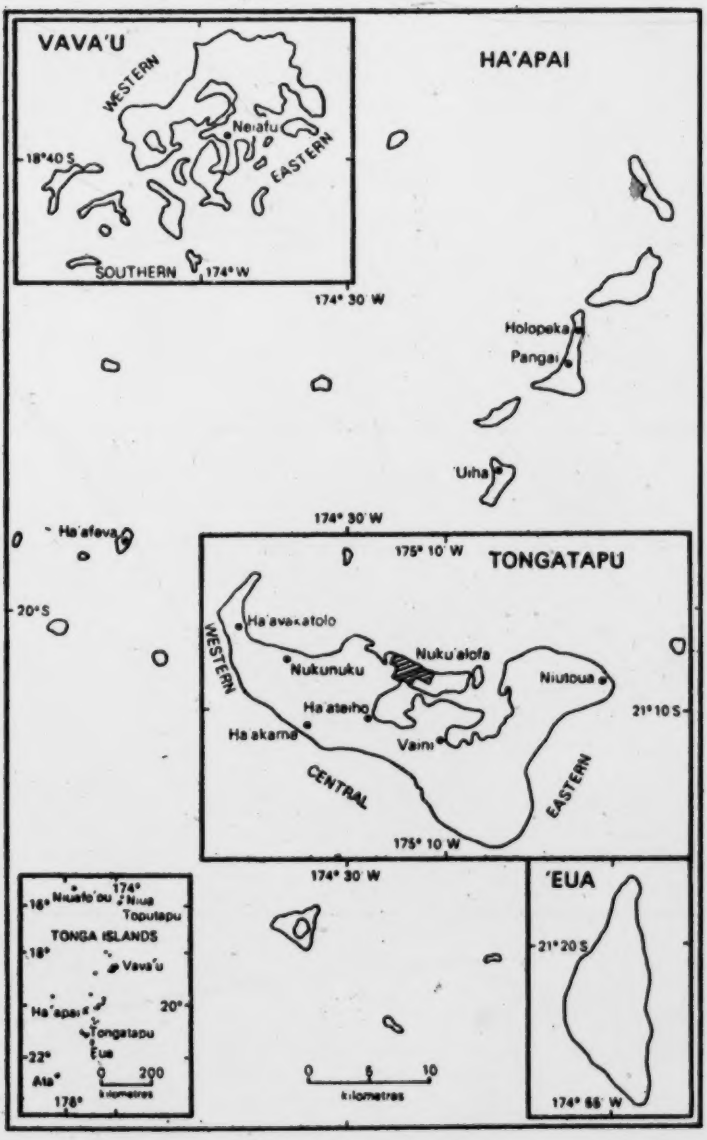

Fig. 7.1 The Kingdom of Tonga: location map

[p. 164]

73: Morton E-5 (1970-1971) 1977 OU9 Tonga OU9
Puke

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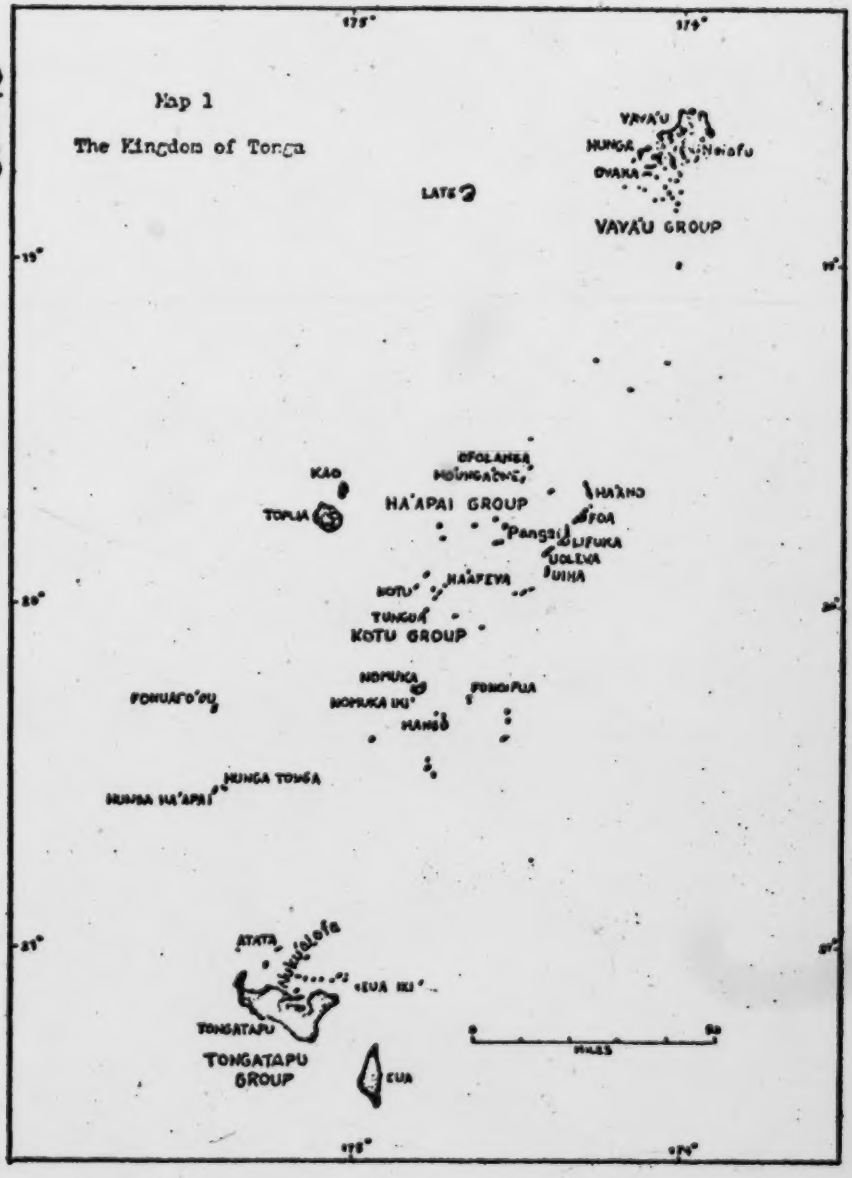
Map 1

The Kingdom of Tonga



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73: Morton E-5 (1970-1971) 1977 OU9 Tonga OU9
Puke

79: Lātūkefu H,I, M-4,5 (1964-1965) 1974
(1822-1875)
OU9 Tonga OU9

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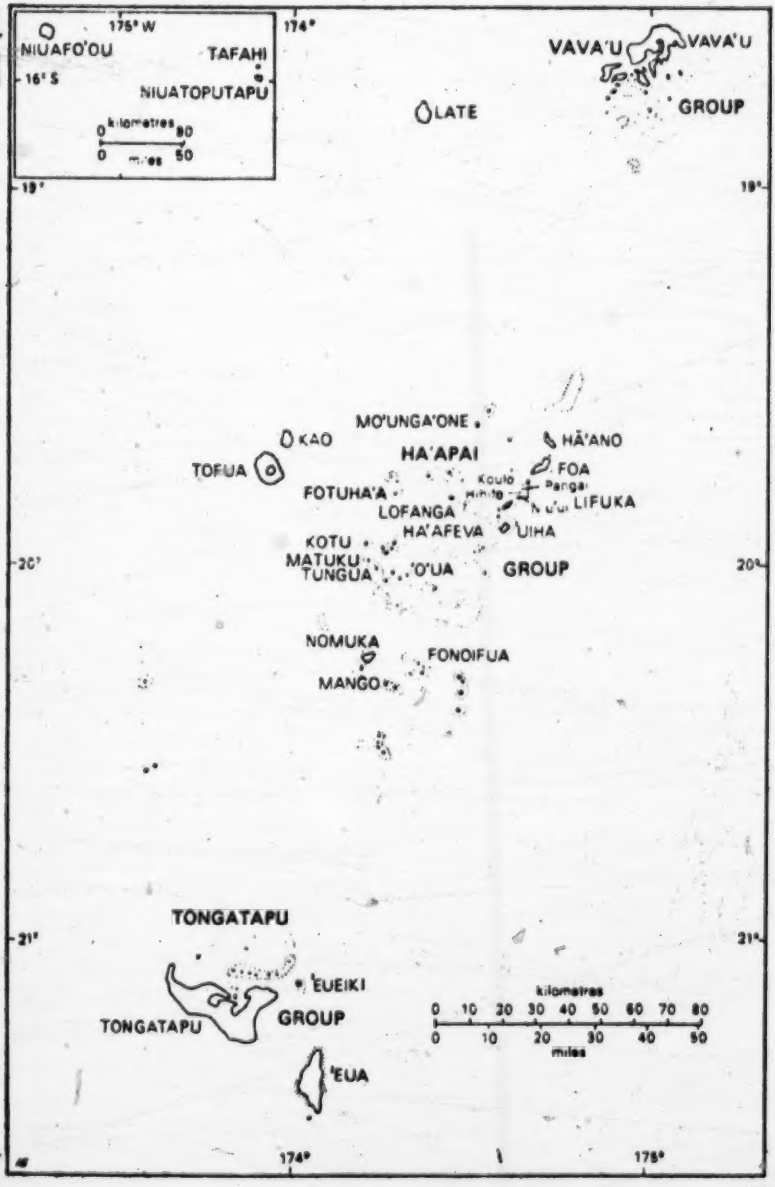
191



Map 1 Tonga.

80: Maude K-5 (1961) 1971 OU9 Tonga OU9

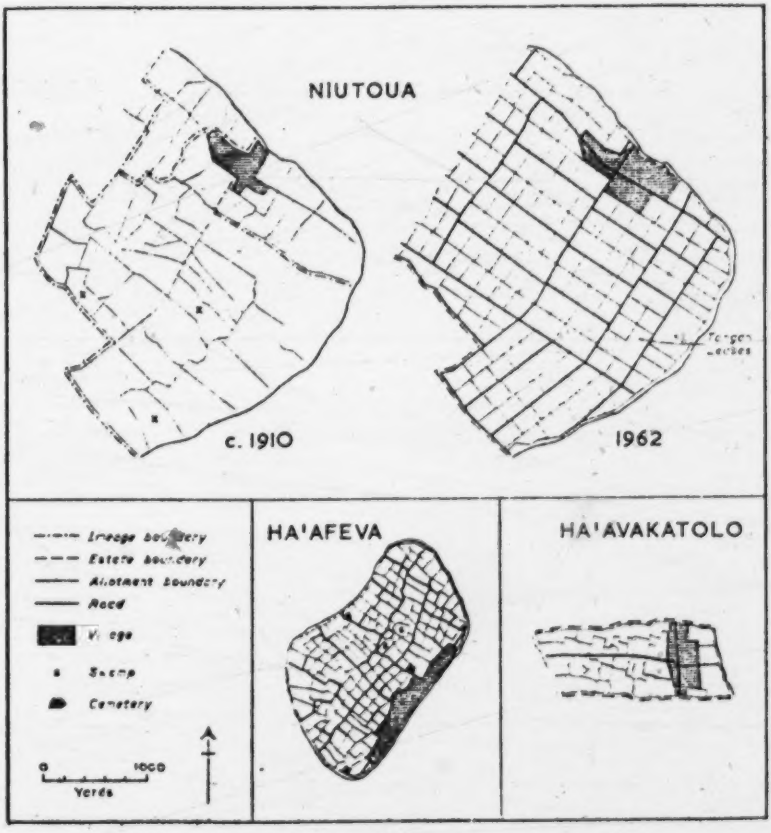


Fig. 1 Land division in Tonga: some examples

him (see also Williamson 1924: vol. II:478-80 and vol. III:119-21). Ultimate title to the land was considered to be vested in the Tu'i Tonga, and the position of a chief seems to have been more that of a ruler of an area and its people than that of a landlord.

THE DEVELOPMENT OF THE PRESENT LAND TENURE SYSTEM

While the exact nature of the traditional tenure system remains uncertain the development of the present system, particularly as it exists in law, can be traced more reliably. The first major change came in 1850 when George Tupou, finally established as the ruler of Tonga, claimed all the land by right of conquest,

87: Wood M,Y-4,5 (no date) 1932 OU9 Tonga OU9

THE VOLCANIC ISLANDS
(INCLUDING FALCON ISLAND AND NIUA FO'OU).

175 (1) 'ATA. Tasman sighted this island in 1643 as he sailed from
103 New Zealand, and he gave it the name of Pylstaart. It is 85 miles S.S.W.
of Togatabu. There are two peaks, the higher being 1,165 feet, but the
133 volcano is extinct. 'Ata contains deposits of guano, suitable for manure,
135 but the lack of a harbour renders these useless commercially. The island
was formerly inhabited. One account stated that people drifted there
174 from Tofua, Tugua and also from Houma in Togatabu, and relationship
with people in those places has been claimed by descendants of the 'Ata
166 people. Another explanation is that 'Ata was settled by refugees from
Atata who fled from the invasion of a cannibal chief, 'Uhila, of Nomuka,
and that these intended to flee to Togatabu but were blown south in a
storm. Still another account relates that refugees from Atata fled in
this way but it was because of the invasion of their island by Finau Ulu-
kalala II in 1799. Shortly after 1860, Tubou I ordered the 200 inhabitants
166 of 'Ata to remove to the village of Ha'atu'a or Kolomaile in 'Eua, on
[648] account of islanders being taken away by kidnapping ships to work in
the mines of Chile, South America. 'Ata was too isolated to be protected
then, and on account of its position and lack of an anchorage it has not
again attracted a population.

133 (2) HUGA TOGA is 490 feet high. (3) HUGA HA'ABAI is
400 feet high. These sister-islands, north-west of Togatabu, contain
[135] deposits of guano but have no anchorage. Volcanic activity has long
ceased.

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FALCON ISLAND.

LAT. 20° 19′ S. LONG. 175° 28′ W.

87: Wood M,Y-4,5 (no date) 1932 OU9 Tonga OU9

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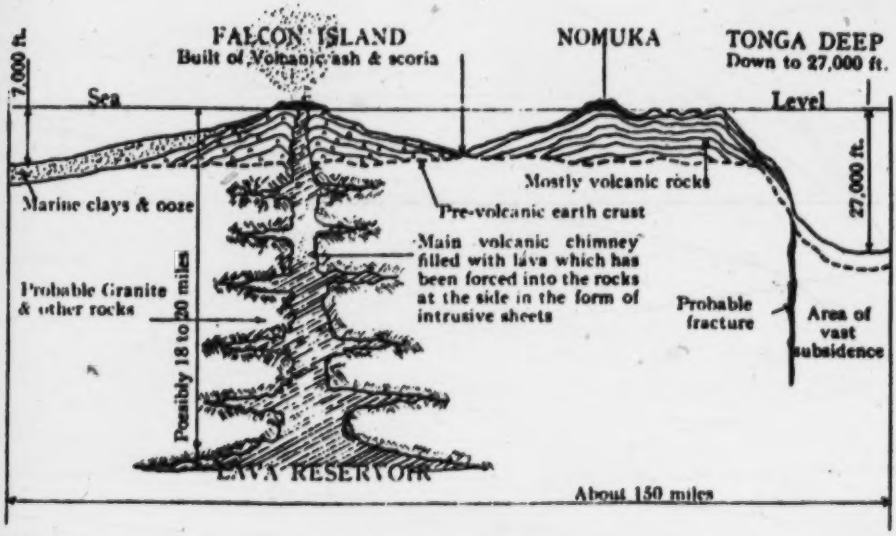

133

FALCON ISLAND.

ALTERNATELY AN ISLAND AND A SHOAL IN THE TONGA OR FRIENDLY ISLANDS GROUP.

Theoretical diagram after T. W. EDGEWORTH DAVID, K.B.E., F.R.S.

(4) FALCON ISLAND (Fonua Fo'ou). This "Jack-in-the-box Island" has erupted and disappeared several times within living memory, leaving only a reef or shoal. The Spaniard, Maurelle, in 1781, and the Frenchman, La Perouse, in 1787, marked a reef near this spot. H.M.S. "Falcon" observed the island in 1865, and in 1877 H.M.S. "Sappho" saw smoke there rising from the sea. In 1885 the island appeared again and was claimed by the Tonga Government; but gradually it vanished, and by 1898 only a reef remained. The reason for the disappearances of Falcon Island is that it is formed only of volcanic ash, which is easily washed down by the rain and waves. No growing coral has ever been found there.

[175]

[136]

The last appearance occurred in October, 1927, when smoke and steam rising several thousand feet could distinctly be seen from Nuku-'alofa, 45 miles away. In May, 1928, the island was visited by scientists and also by the Premier of Tonga, who annexed it for the Government. The island was then roughly circular, about two miles across, and 365 feet high. The crater was near the south-east of the island, nearly a mile

[423]

87: Wood M,Y-4,5 (no date) 1932 OU9 Tonga OU9

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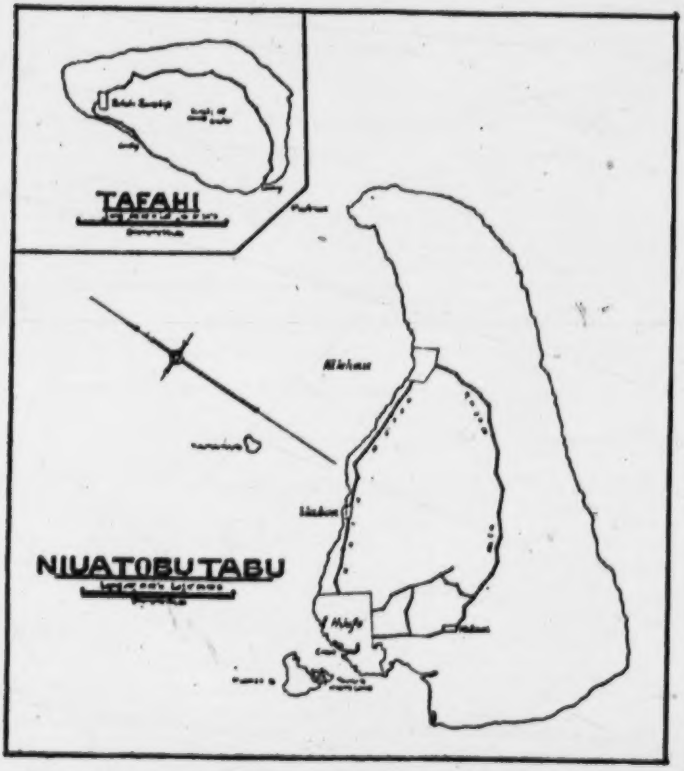
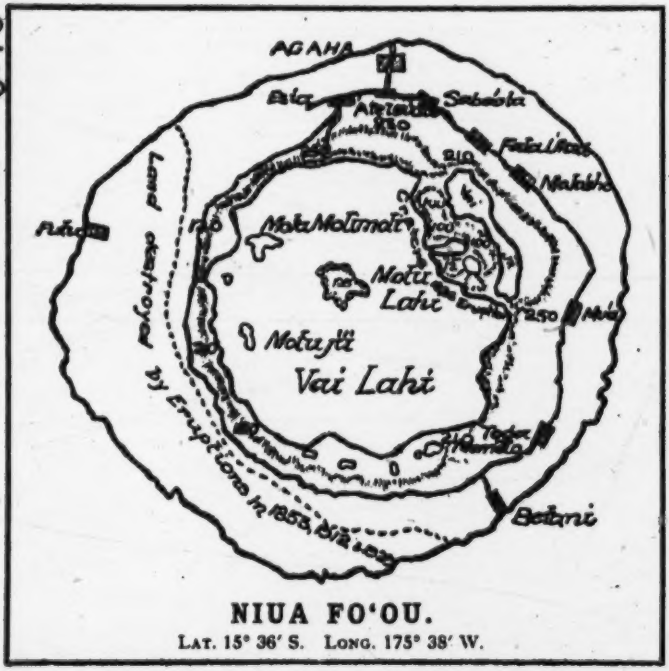


(9) NIUA TOBUTABU is 167 miles north of Vava'u. The island may be classed as of volcanic formation though there is no sign of any recent activity there. Niua Tobutabu is generally flat but rises to a hill 350 feet high in the centre. The area is nearly six square miles, and there are four villages with a population of 743. The island is subject to hurricanes, the last severe one having taken place on 26th December, 1930. The rhinoceros beetle which entered from Samoa threatened to destroy the coconuts within recent years, but it has now been exterminated. There are two large stones on the island, called Fakafafa, said by a legend to have been placed there by Maui. A spring with its small stream, Niutoua, is an unusual sight in Tonga. The first Englishman who came to Tonga, Captain Wallis, in 1767, named Niua Tobutabu Keppel and Tafahi Boscawen, after two English admirals, and Keppel is the name still often used by Europeans for the former island.

(10) TAFAHI is an extinct volcano with an elevation of 2,000 feet, a cone-shaped and very rocky island containing one small village. Tafahi was the first part of the whole group seen by Europeans, the Dutch voyagers, Schouten and Lemaire, in 1616. They called Tafahi Cocos Island because of its trees, and Niua Tobutabu Traitors' Island because of the treacherous attack made on them by Ma'atu and his people.

87: Wood M,Y-4,5 (no date) 1932 OU9 Tonga OU9



NIUA FO'OU.

LAT. 15° 36′ S. LONG. 175° 38′ W.

(11) NIUA FO'OU is the most remote island of the group, being much closer to Samoa and Fiji than to Togatabu. It is 109 miles W.N.W. of Niua Tobutabu and 211 miles N.W. of Vava'u. Niua Fo'ou is almost circular and is 19 square miles in extent, including the lakes which cover six square miles. It rises to 588 feet and has a dangerous, dormant volcano whose more recent eruptions have occurred in 1853 (when 25 people were killed), in 1867, 1886, 1912 and 1929. The village of Ahau was destroyed in 1853 and Futu in 1929, and both sites have been abandoned.

The last eruption is typical. On 25th July, 1929, a line of small craters opened up across the island on the western side, from the south-west coast to the north-west; these craters were so close that they formed almost a continuous line. Lava flowed down the western slopes to the sea, destroying nearly every building in Futu, and covering 2,000 acres which will be useless for cultivation for many years. The harbour at Futu is now cut off by the great lava-field. The people of Futu barely escaped with their lives and lost all their goods. They have since built a new village not far from Agaha named 'Alele'uta.

There are little islands in the lakes of Niua Fo'ou and little craters in those islands also. In some places in the lakes hot springs have been found, and in others the depth cannot be ascertained.

American and New Zealand astronomers observed the total eclipse of the sun at Niua Fo'ou on 22nd October, 1930.

87: Wood M,Y-4,5 (no date) 1932 OU9 Tonga OU9

Disastrous hurricanes frequently occur, and the island has been ravaged as recently as December, 1930, February, 1931, and March, 1932. During the hurricane season Niua Fo'ou is not visited by small craft. Though the island has been so repeatedly devastated by eruptions and storms, and its condition seems to be more dangerous than that, for instance, of the uninhabited large island of Tofua, still there is no intention of abandoning it for a safer home closer to the main islands of the group.

Its present population is 1,291. The inhabitants are a distinct type, with local variations of the Tongan language due to ancient contact with Samoa and Uvea, but more intercourse with the rest of the Tongan group is causing these old words to fall into comparative disuse.

The "Tin-can Mail" is Niua Fo'ou's claim to distinction. As the harbour at Agaha is inconvenient, and the sea is generally too rough for canoes, the mail is taken by swimmers to the steamer which passes from Samoa to Fiji. The outgoing mail is generally wrapped in oiled paper and tied to sticks, and the inward mail is brought back from the steamer in a sealed tin-can.

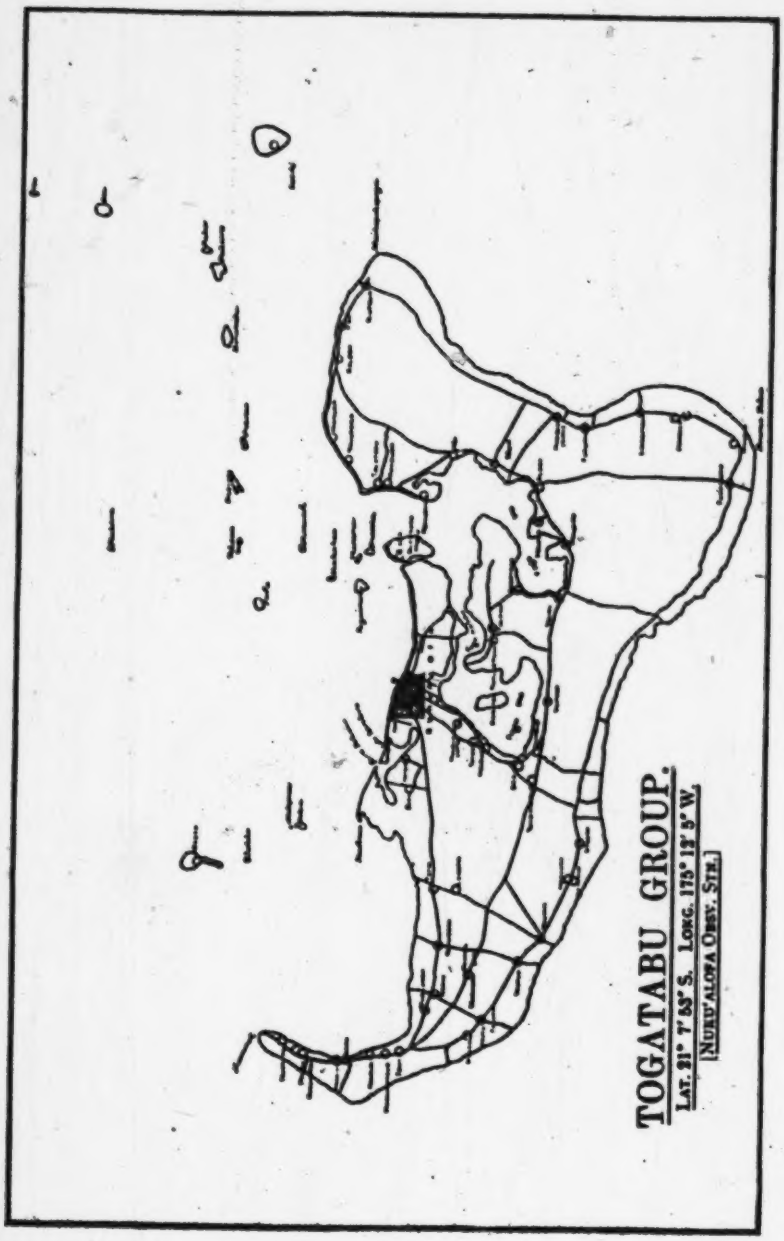
THE CHIEF CORAL ISLANDS, WITH SCENIC AND HISTORIC PLACES.

'EUA. This island, which is of great age geologically, reaches a height of 1,078 feet, and has an area of 33 square miles. Although it is as large as Vava'u and contains fertile soil in abundance, its population of 348 is most disproportionate. Its inadequate harbour at 'Ohonua and the sometimes dangerous channel between the island and Togatabu, though disadvantageous to the progress of 'Eua, do not really explain the decline in its population; this is due rather to the proximity of Nuku'alofa with its attractions. Considering that many small islands in Ha'abai support numerous taxpayers who have no allotments, the neglect of 'Eua is regrettable.

'Eua was called Middelburg by its discoverer, Tasman, and Cook had a high opinion of its beauty and fertility. This island is unique in several respects. It has several small creeks which rise from springs in the hillsides and descend to the western shore;

[TEXT CONTINUED ON PAGE 79]

87: Wood M,Y-4,5 (no date) 1932 OU9 Tonga OU9



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87: Wood M,Y-4,5 (no date) 1932 OU9 Tonga OU9

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87: Wood M,Y-4,5 (no date) 1932 OU9 Tonga OU9

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88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

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Figure 1.

Figure 2. Outline map of Tongatapu showing the distribution, locations, and sample numbers of the 101 (106 before unrepresentative samples were eliminated) allotments surveyed as part of the survey of bush allotments.

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

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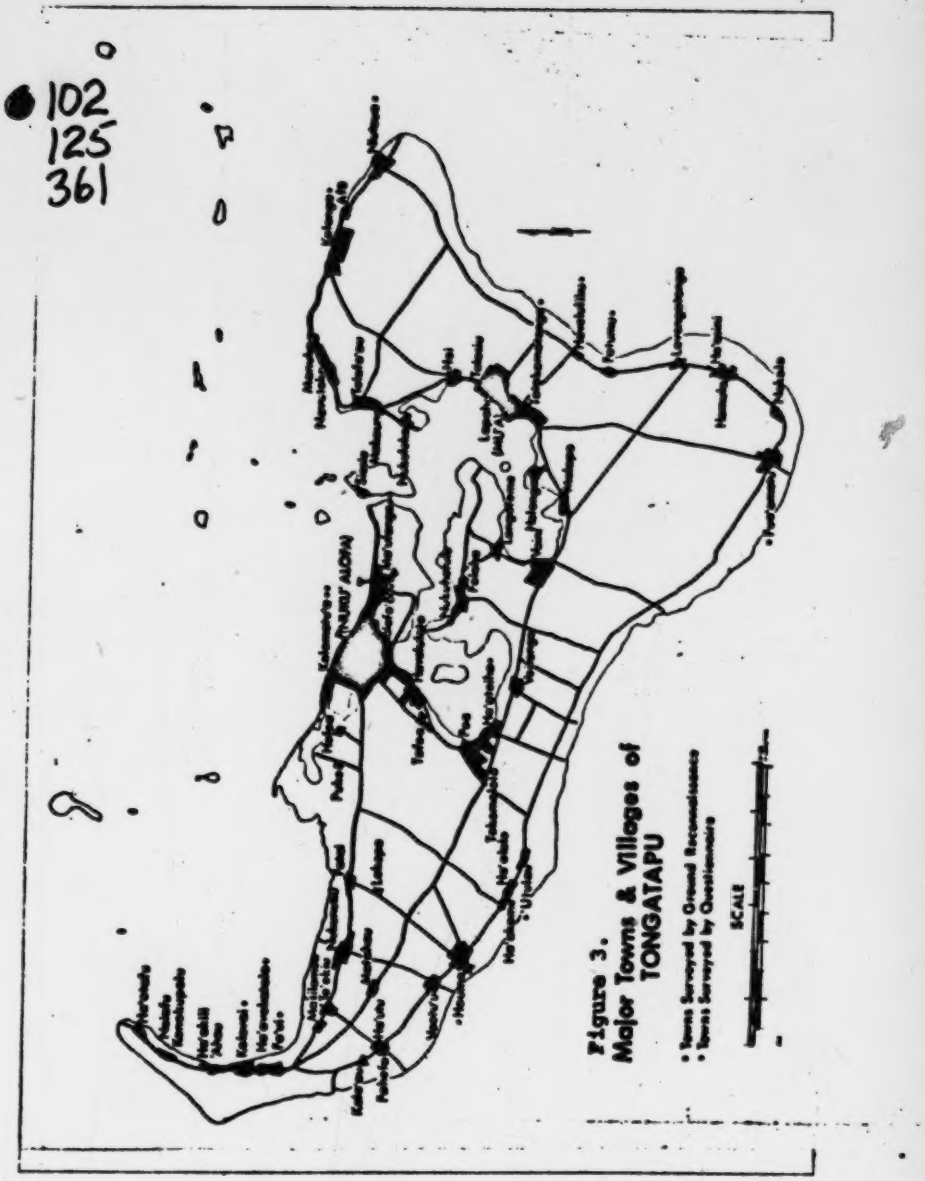
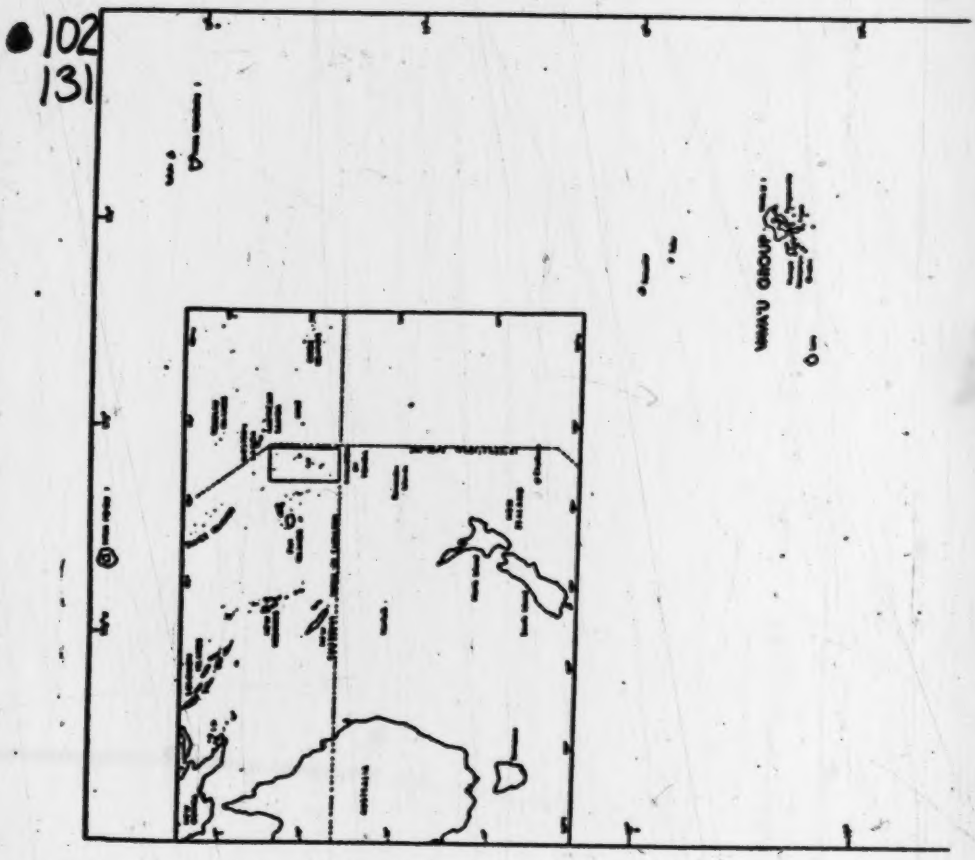


Figure 4. Outline map of Tongatapu Island showing the three major districts of Hihifo (Western), Vahe Loto (Central), and Hahake (Eastern) as well as the urban area of Nuku'alofa.

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu



88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

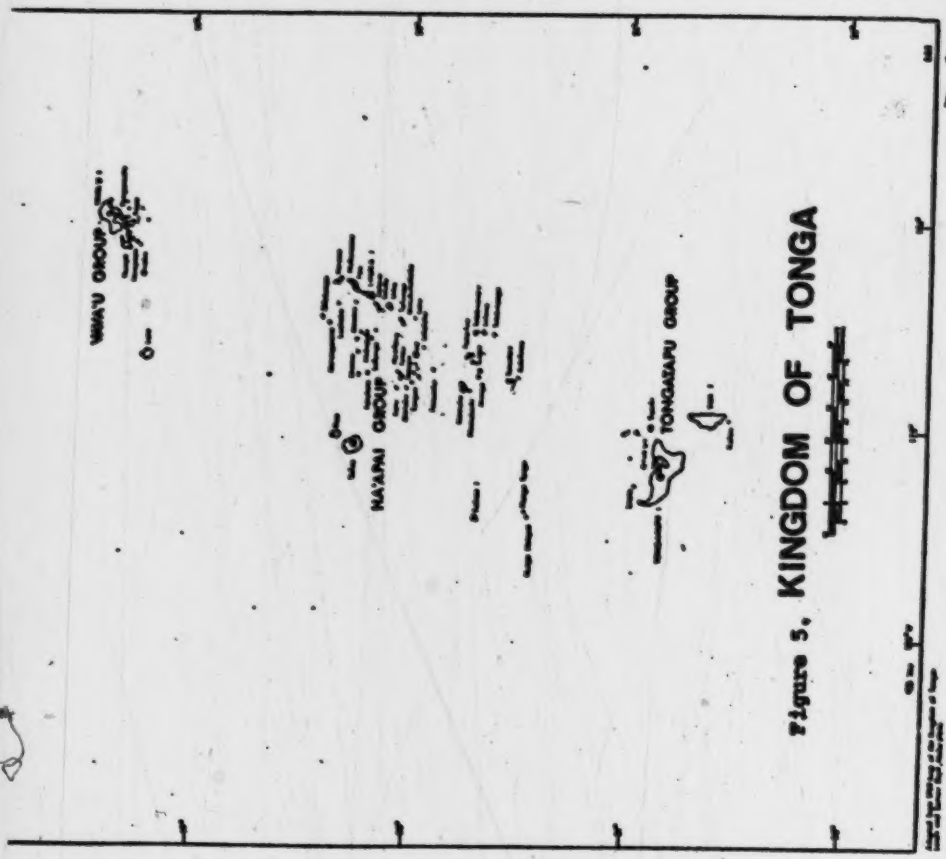


Figure 5.

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[p. 20-A]

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

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Figure 7. SOIL MAP OF TONGATAPU

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

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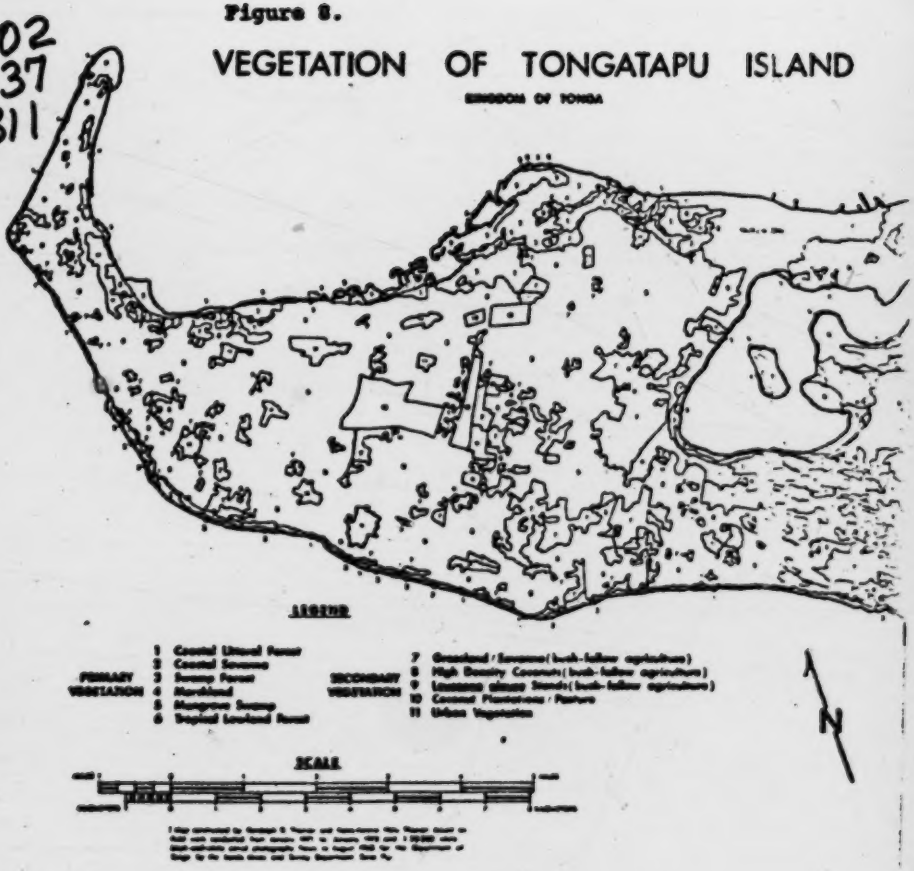
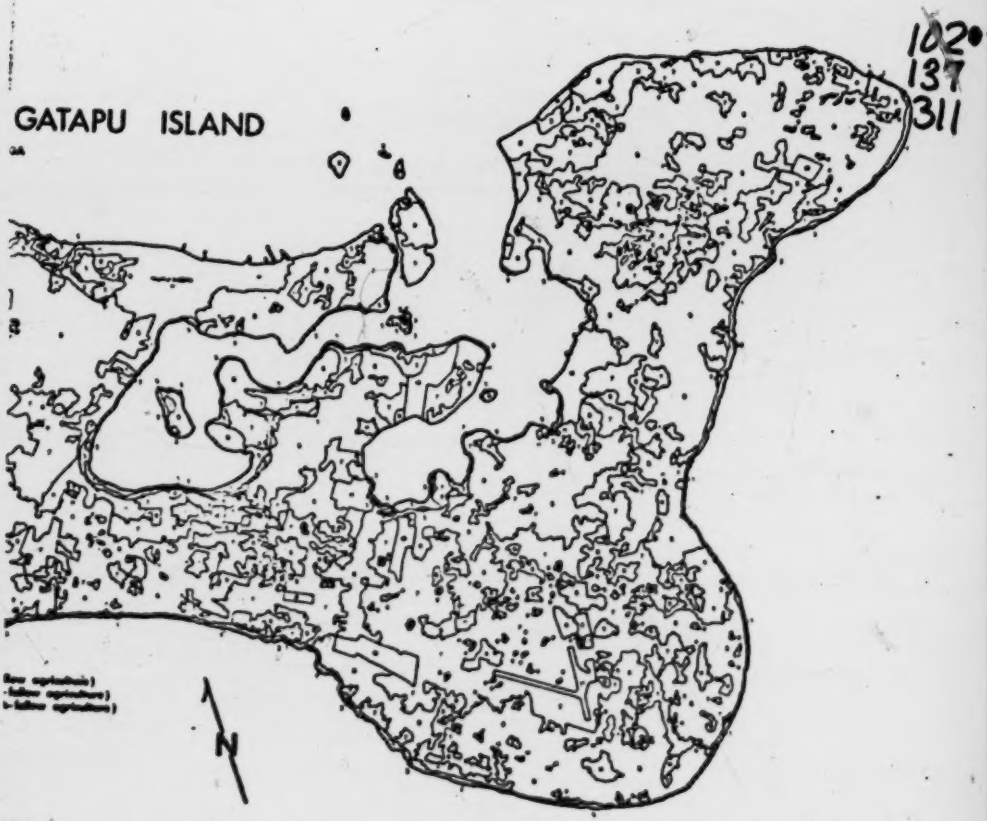
Figure 8.



[p.38-A]



[p. 38-B]

88: Thaman K-5 (1967-1973) 1978 0U9 Tonga 0U9
Tongatapu

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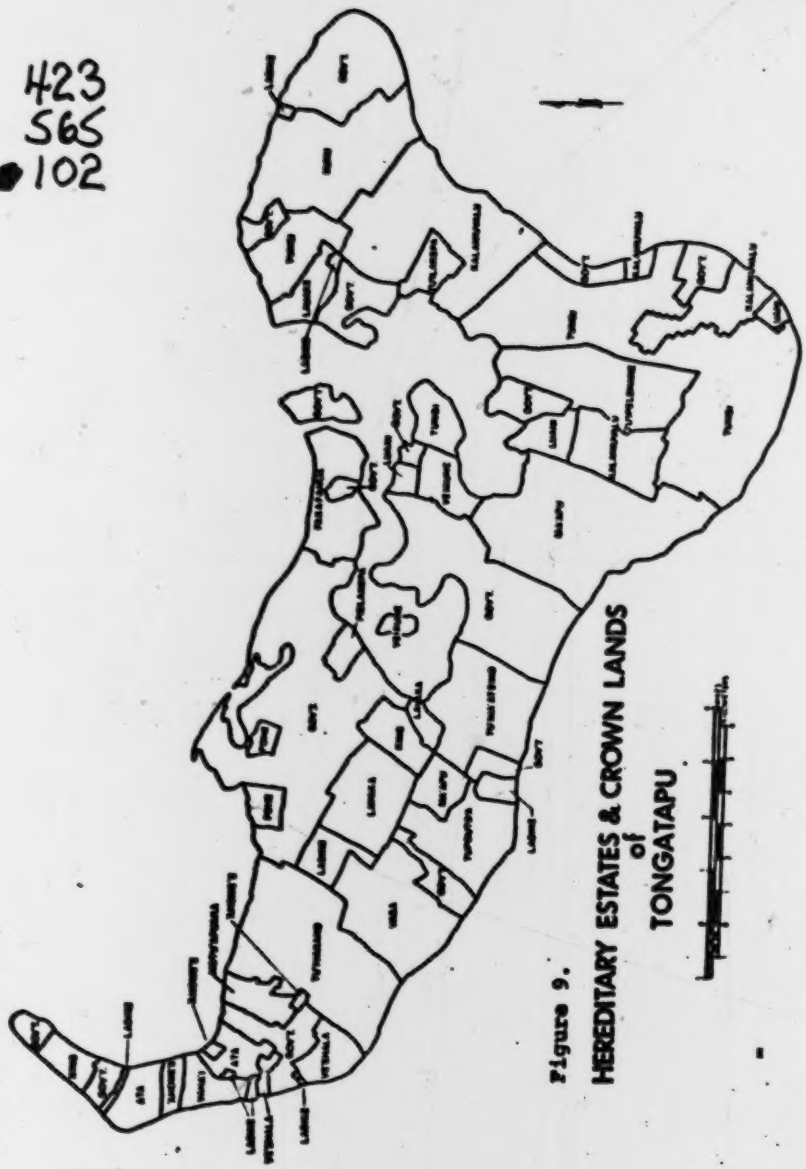

Figure 9.
HEREDITARY ESTATES & CROWN LANDS
of
TONGATAPU

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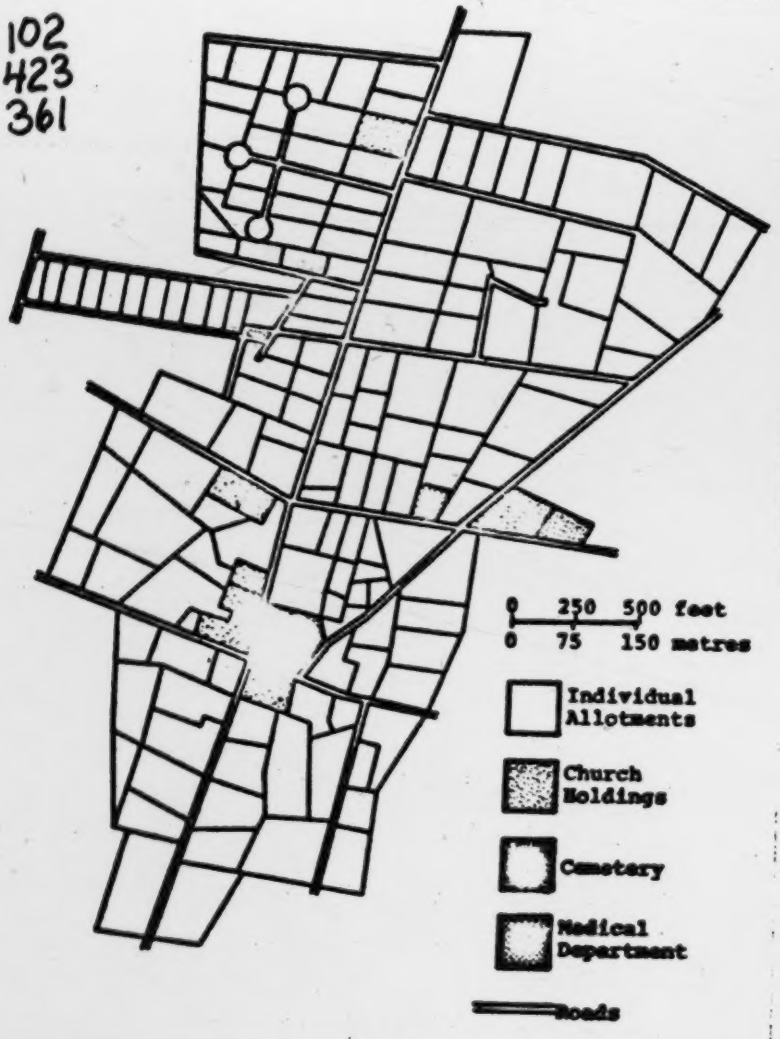

Figure 10. Subdivision of the Houma township reserve.

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361

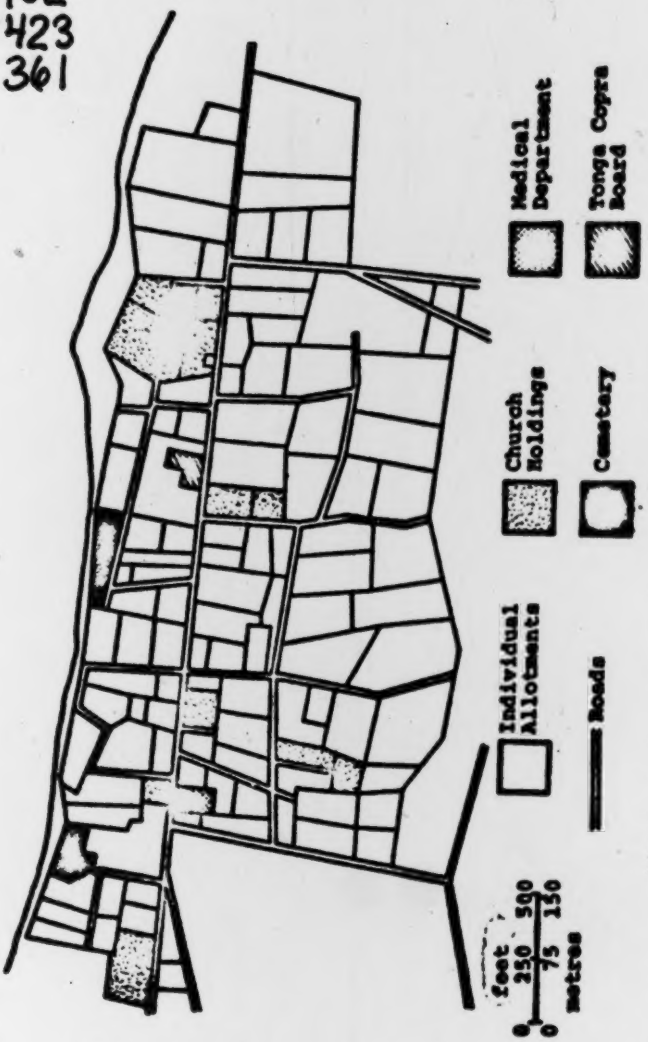

Figure 11. Subdivision of the Kolonga township reserve.

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

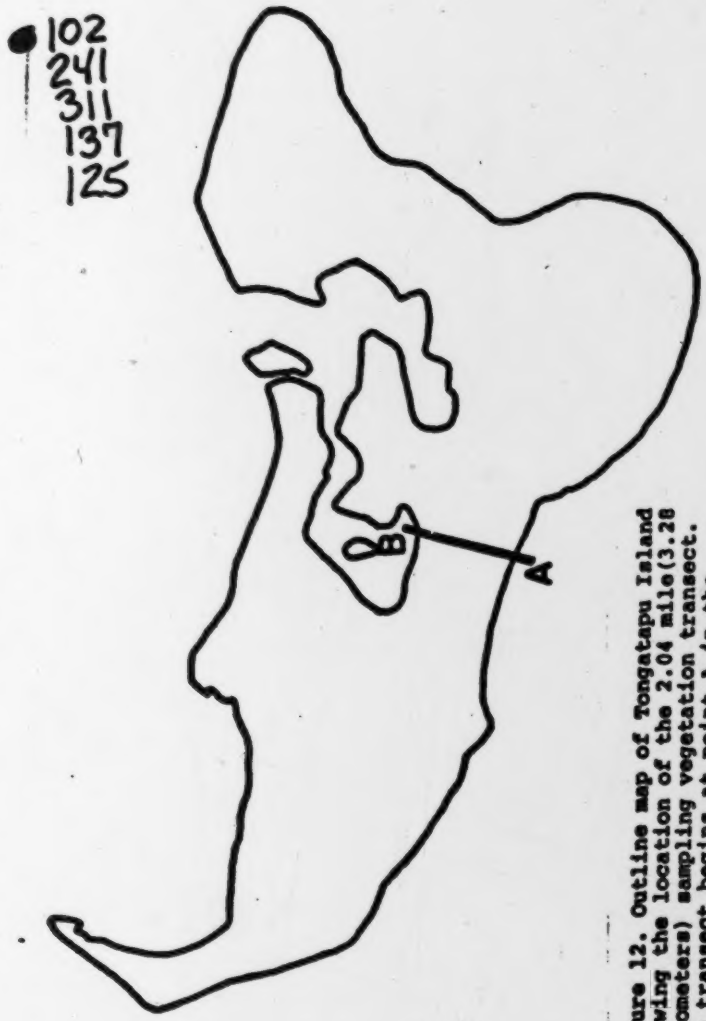

Figure 12. Outline map of Tongatapu Island showing the location of the 2.04 mile(3.28 kilometers) sampling vegetation transect. The transect begins at point A in the coastal littoral forests of the upraised south coast and ends at point B in the mangrove forests along the low-lying north coast.

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311
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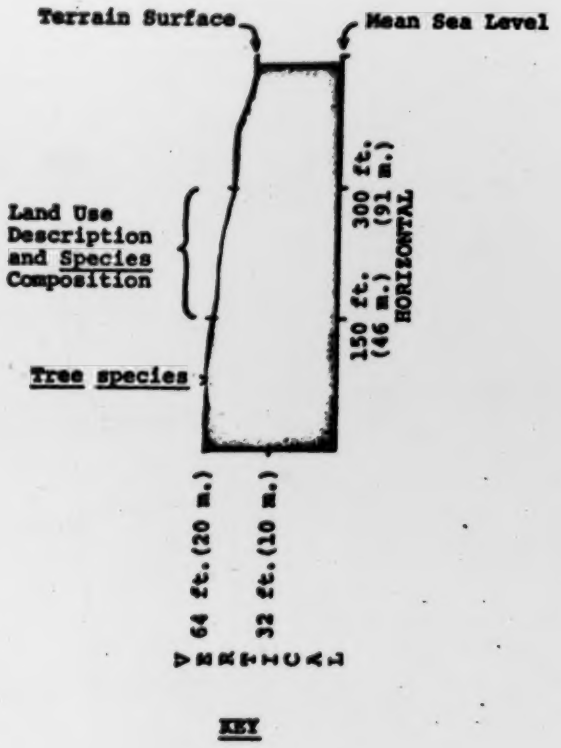

Figure. 13. Tongatapu land use and vegetation transect and key.

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241
102

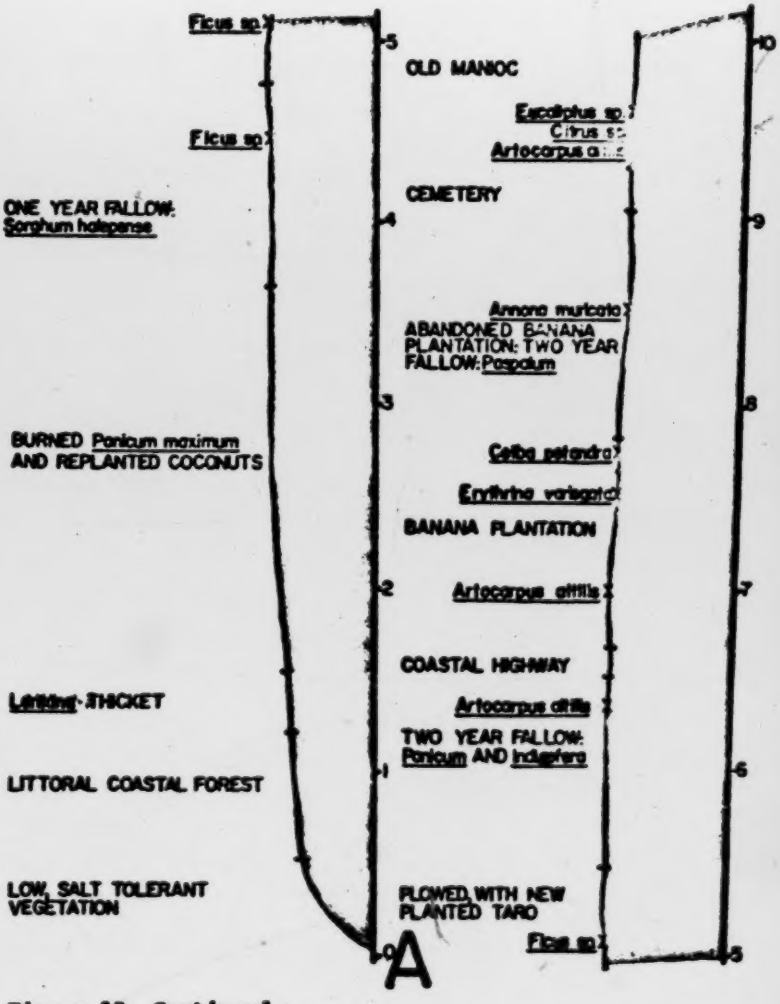


Figure 13. Continued.

88: Thaman K-5 (1967-1973) 1978 0U9 Tonga 0U9 Tongatapu

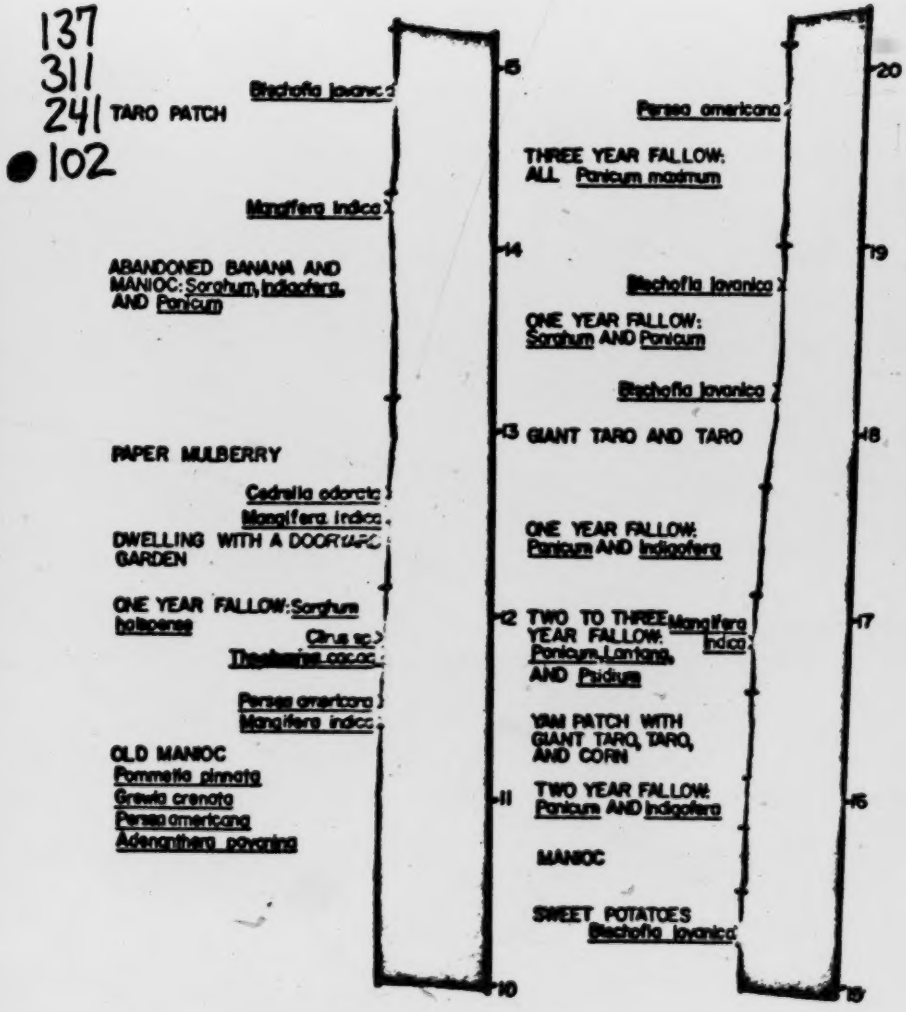


Figure 13. Continued.

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

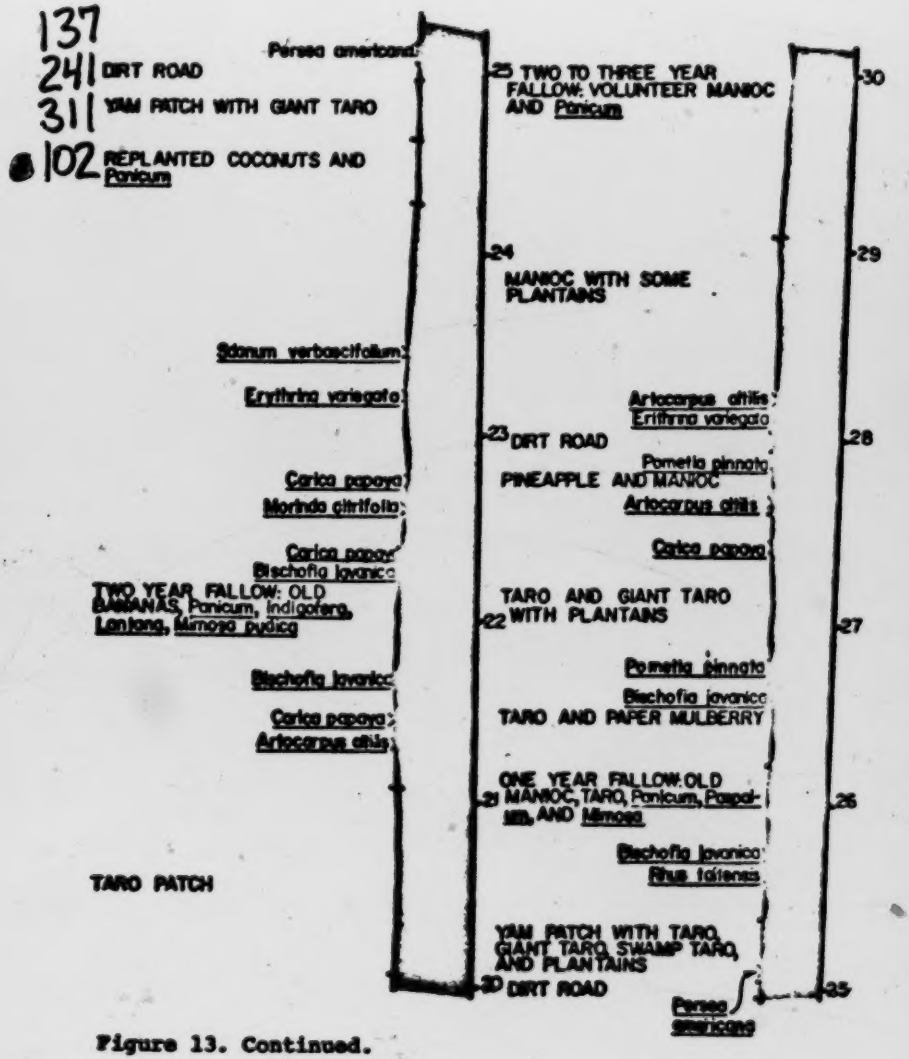


Figure 13. Continued.

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

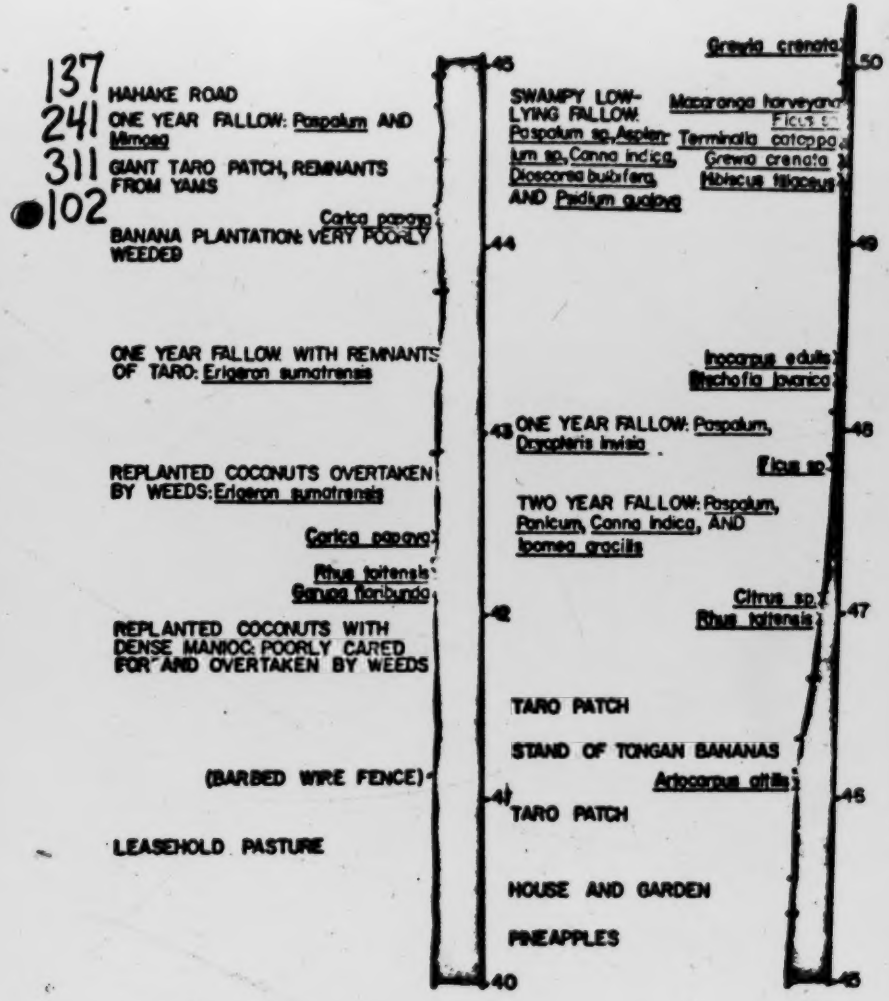


Figure 13. Continued.

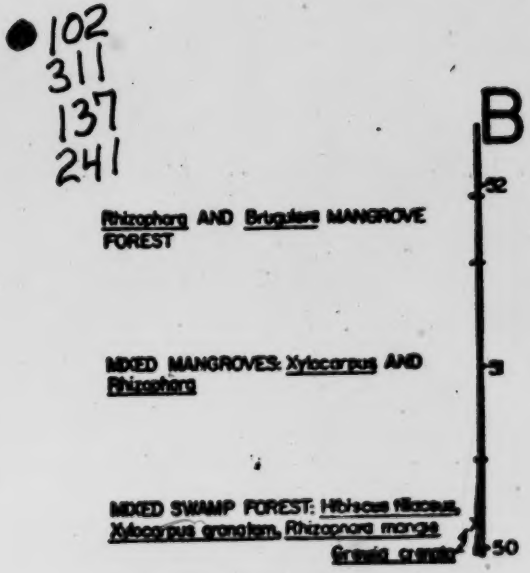


Figure 13. Continued.

102
241
311
137
245

Table 28. Key to important tree species for maps of sample bush allotments (Figures 14-42). Allotment numbers refer to sample numbers used during the survey.

Symbol	Scientific Name	English Name	Tongan Name
Aa	Artocarpus altilis	breadfruit	mei
Am	Aleurites moluccana	candlenut	tuitui
Amu	Annona muricata	soursop	'apele 'Initia
Ap	Adenanthera pavonina	bead tree	lopa
Az	'Alphitonia zizyphoides		toi
Ba	Barringtonia asiatica	poison fish tree	futu
Bc	Bruguiera conjugata	mangrove	tongo
Bj	Bischofia javanica		koka
Br	Burkella richii		kau
C	Citrus medica	citron	kola
Ci	Calophyllum inophyllum		feta'u
Cl	Citrus limon	lemon	lemani
Cm	Citrus maxima	pomelo	moli Tonga
Cma	Cerbera manghas		toto
Co	Cananga odorata	perfume tree	mohokoi
Cod	Cedrela odorata	silky oak	sita Palangi
Cp	Ceiba pentandra	kapok	vavae
Cr	Citrus reticulata	mandarin	molipeli
Cs	Citrus sinensis	orange	moli kai
Df	Diospyros ferrea		kanume
Dfo	Dysoxylon forsteri		mo'ota

Table 28. Continued.

102
241
311
137
245

Symbol	Scientific Name	English Name	Tongan Name
Dl	Diospyros laterifolia		mapa
Ea	Excoecaria agallocha		feta'anu
Ef	Ellatostachys falcata		ngatata
Eo	Ervatamia orientalis		te'ete'emanu
Et	Elaeocarpus tonganus		ma'ama'alava
Ev	Erythrina variegata	coral tree	ngatae
Fb	Fagraea berteriana		pua Tonga
Fo	Ficus obliqua		'ovava
Fs	Ficus scabra		masi'ata
Ga	Gyrocarpus americanus		puko
Gc	Grewia crenata		fo'ui
Gf	Garunga floribunda		manaui
Gr	Glochidion ramiflorum		malolo, masikoka
Gro	Grevillea robusta	silky oak	'oke
Gs	Garcinia sessilis		heilala
Hl	Heritiera littoralis		ifi tahi
Hn	Homolanthus nutans		malamala'afonua
Ho	Hernandia ovigera		fotulona
Ht	Hibiscus tiliaceus	hibiscus	kaute
Ie	Inocarpus edulis	Tahitian chestnut	ifi
Jc	Jatropha curcas	physic nut	fiki
Ll	Lumnitzera littorea		hangale

Table 28. Continued

102
241
311
137
245

Symbol	Scientific Name	English Name	Tongan Name
Ma	Melia azedarach		sita
Mc	Morinda citrifolia		nonu
Mh	Macaranga harveyana		loupata
Mhy	Myristica hypargyraea	nutmeg	kotone
Mi	Mangifera indica	mango	mango
Mm	Mertya macrophylla		kulukulu
Oo	Ochrosia oppositifolia		fao
Pa	Persea americana	avocado	'avoka
Pac	Plumeria acuminata	frangipani	kalosipani
Par	Pittosporum arborescens		masi'aukava
Pg	Psidium guajava	guava	kuava
Pgl	Parinarium glaberrimum		pipi, pipi faiolo
Pp	Pometia pinnata		tava
Ppe	Prunus persica	peach	piisi
Pt	Pandanus tectorius	screw pine	fa
Rm	Rhizophora mangle or R. micronata	mangrove	tongo, tongolei
Rt	Rhus taitensis		tavahi
Scl	Syzygium clusiaefolium		fekika vao
Sc	Syzygium corynocarpium		hehea

Table 28. Continued

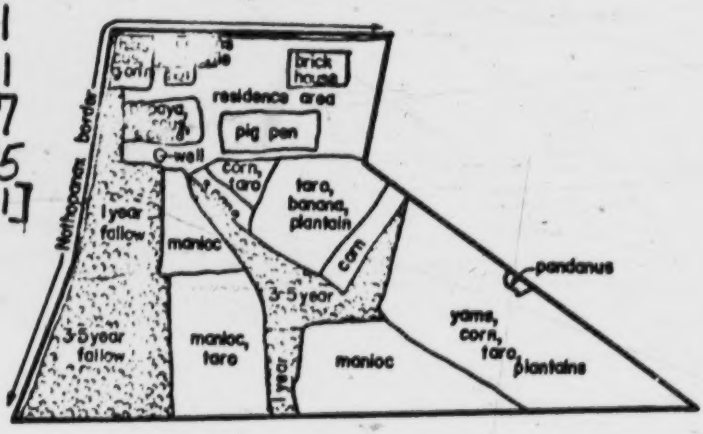
102
241
311
137
245

Symbol	Scientific Name	English Name	Tongan Name
Sd	Spondias dulcis		vi
Sj	Syzygium jambos	rose apple	fekika Palangi
Sm	Syzygium malaccense	malay apple	fekika kai
Sy	Santalum yasi	sandlewood	ahi
Ta	Tournefortia argentea	beach heliotrope	touhuni
Tc	Terminalia catappa	Indian almond	telie
Ts	Tarenna sumbucina		manonu
Va	Vavaea amicorum		ahi vao
Xg	Xylocarpus granatum	cannonball tree	lekileki

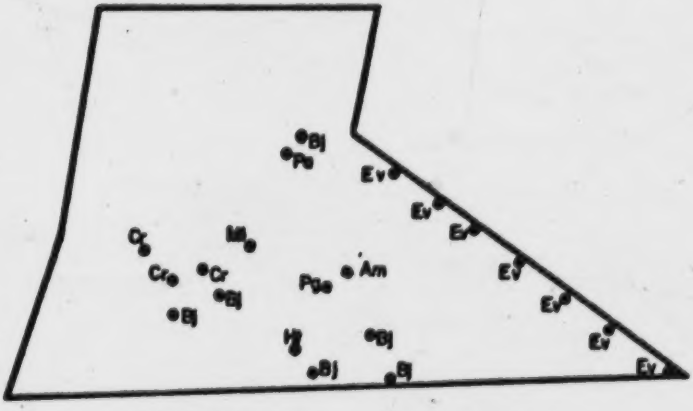
Figure 14. SAMPLE BUSH ALLOTMENT NO. 2

Location: Hofoa Area: 8.25 Acres

102
241
311
137
245
[351]



Distribution of Major Crops



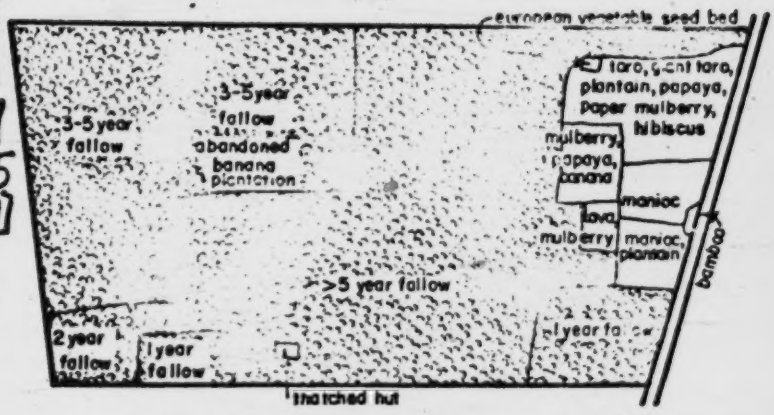
Distribution of Important Tree Species

(Coconut Coverage: 75% Mature Palms; No Replanted Palms.)

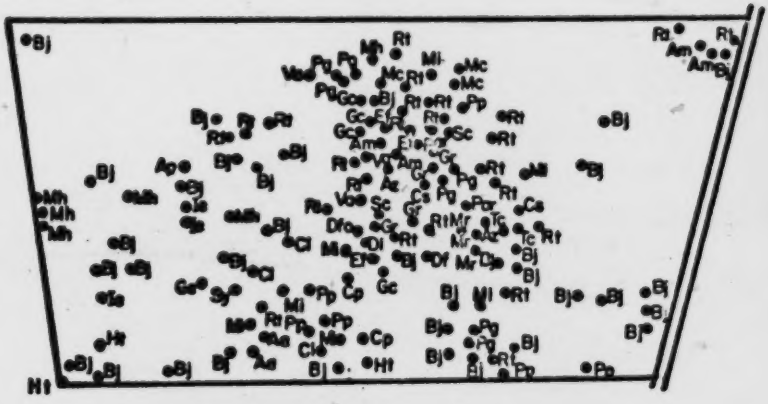
Figure 15. SAMPLE BUSH ALLOTMENT NO. 3

Location: Hofoa Area: 8.26 Acres

102
241
311
137
245
[351]



Distribution of Major Crops



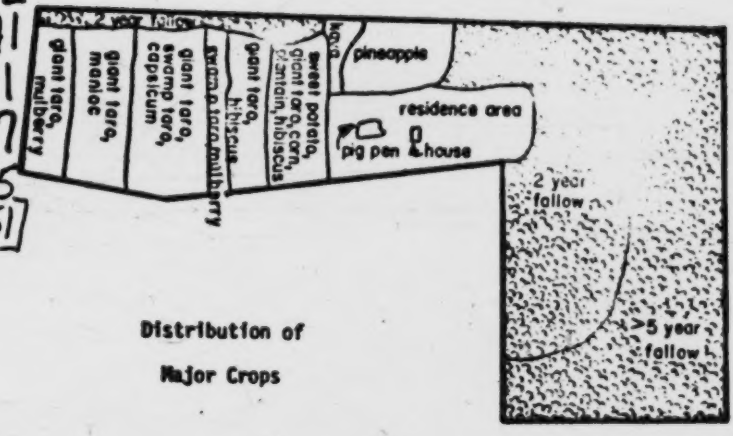
Distribution of Important Tree Species

(Coconut Coverage: 75% Mature Palms; No Replanted Palms.)

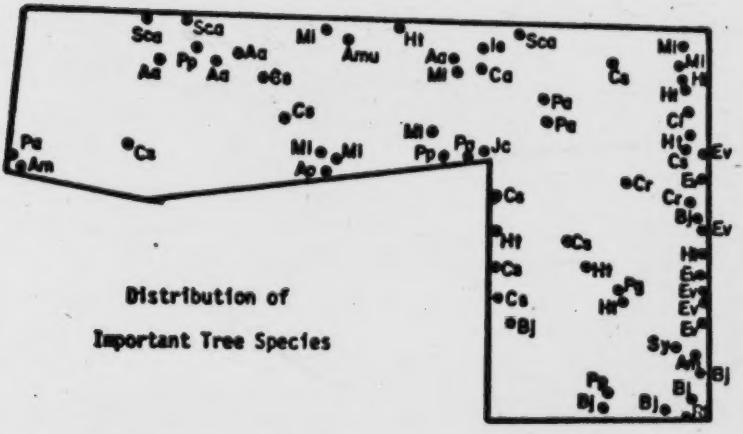
Figure 16. SAMPLE BUSH ALLOTMENT NO. 6

Location: Haveluloto **Area:** 6.41 Acres

102
241
311
137
245
[351]



Distribution of Major Crops



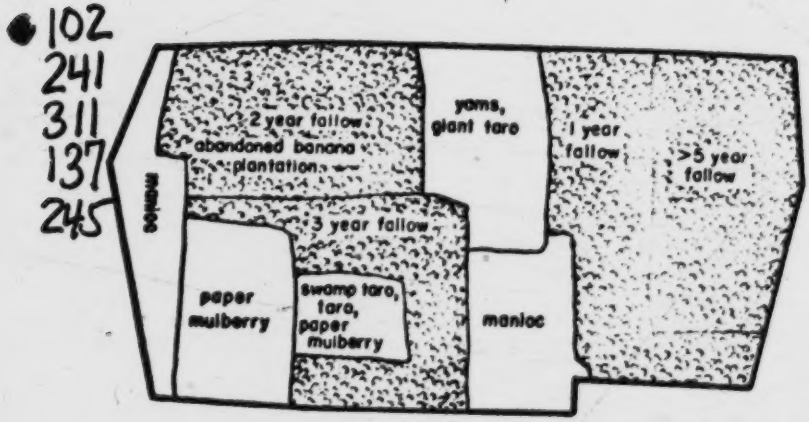
Distribution of Important Tree Species

(Coconut Coverage: 50% Mature Palms; No Replanted Palms.)

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9 Tongatapu

Figure 17. SAMPLE BUSH ALLOTMENT NO. 10

Location: Ma'ufanga **Area:** 8.36 Acres



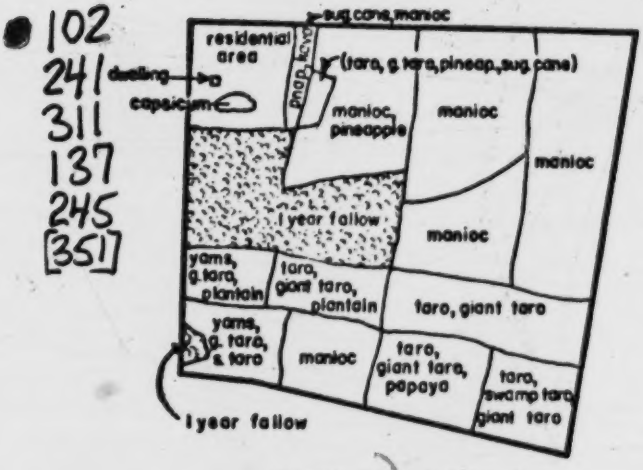
Distribution of Major Crops'

Distribution of Important Tree Species

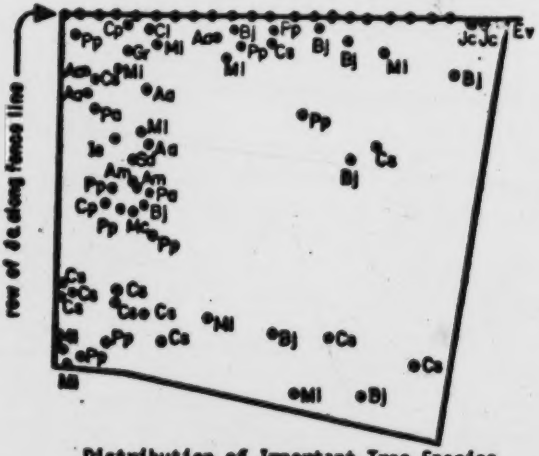
(Coconut Coverage: 50% Mature Palms; No Replanted Palms.)

Figure 18. SAMPLE BUSH ALLOTMENT NO. 12

Location: Hofoa Area: 4.76 Acres



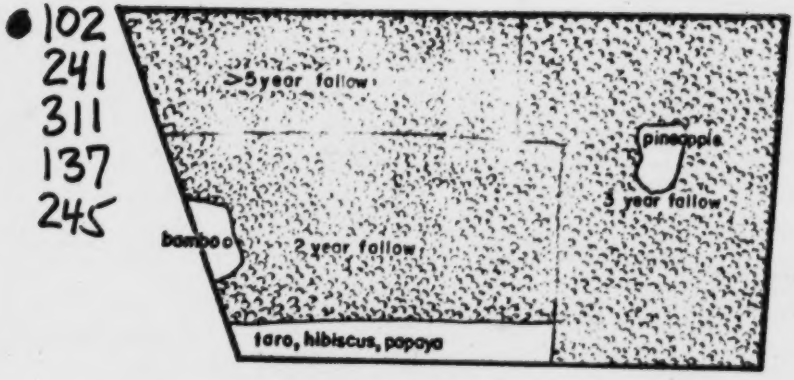
Distribution of Major Crops



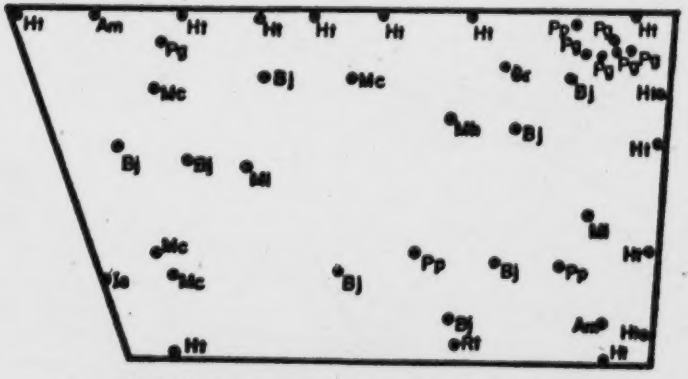
Distribution of Important Tree Species
(Coconut Coverage: 75% Mature Palms; 10% Replanted Palms.)

Figure 19. SAMPLE BUSH ALLOTMENT NO. 15

Location: Liahona Area: 8.25 Acres



Distribution of Major Crops



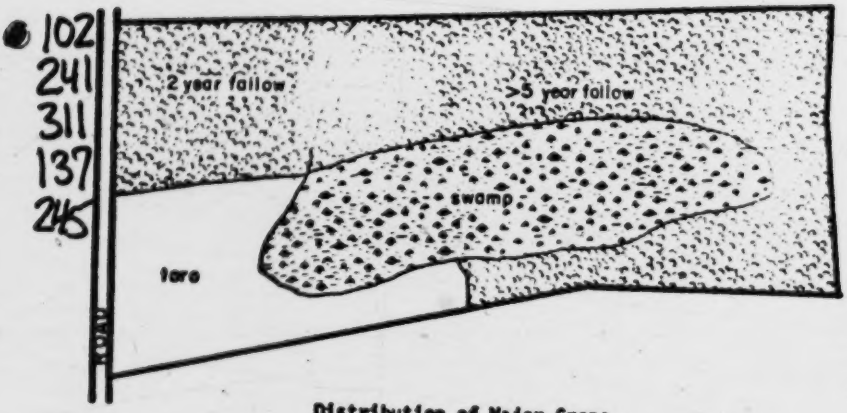
Distribution of Important Tree Species

(Coconut Coverage: 50% Mature Palms; 5% Replanted Palms.)

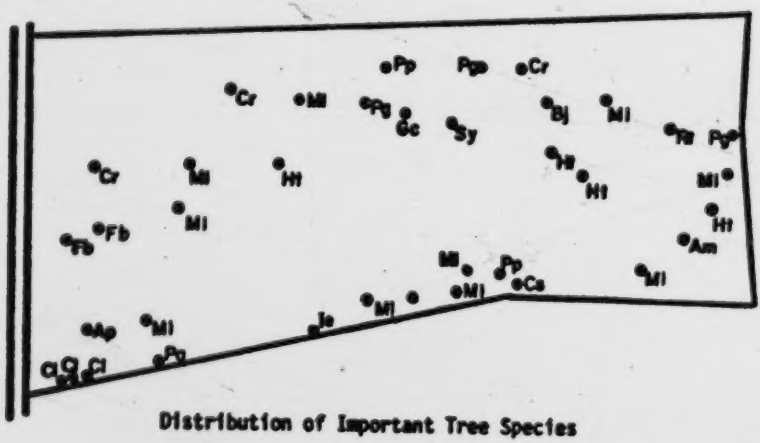
88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

Figure 20. SAMPLE BUSH ALLOTMENT NO. 19

Location: Fatai **Area: 8.27 Acres**



Distribution of Major Crops

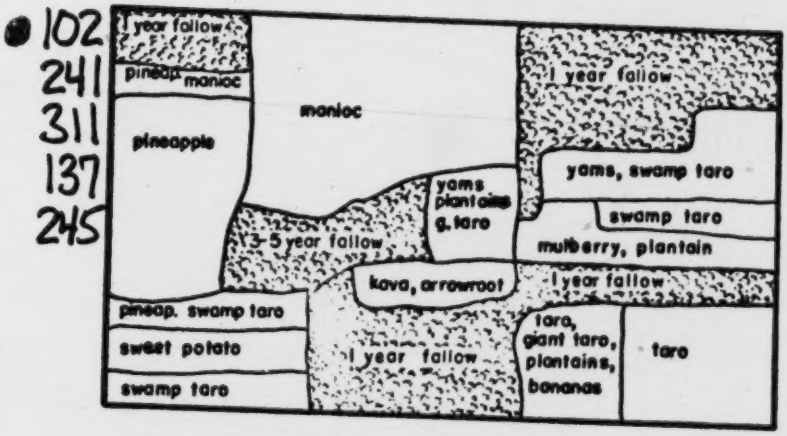


Distribution of Important Tree Species

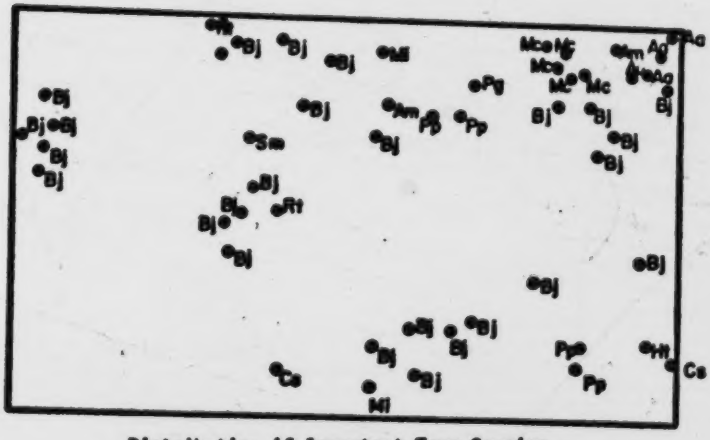
(Coconut Coverage: No Coconuts.)

Figure 21. SAMPLE BUSH ALLOTMENT NO. 21

Location: Lakepa Area: 8.25 Acres



Distribution of Major Crops

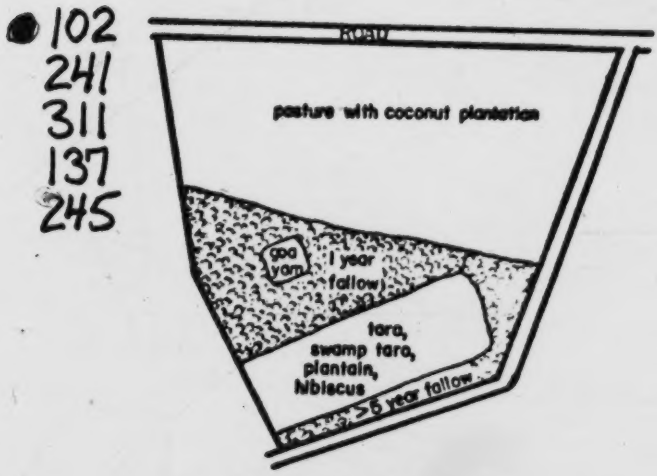


Distribution if Important Tree Species
(Coconut Coverage: 25% Mature Palms; 75% Replanted Palms.)

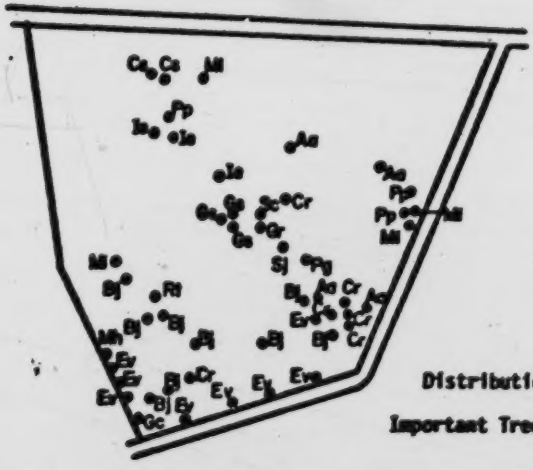
88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9 Tongatapu

Figure 22. SAMPLE BUSH ALLOTMENT NO. 27

Location: Fe'ui Area: 5.01 Acres



Distribution of Major Crops



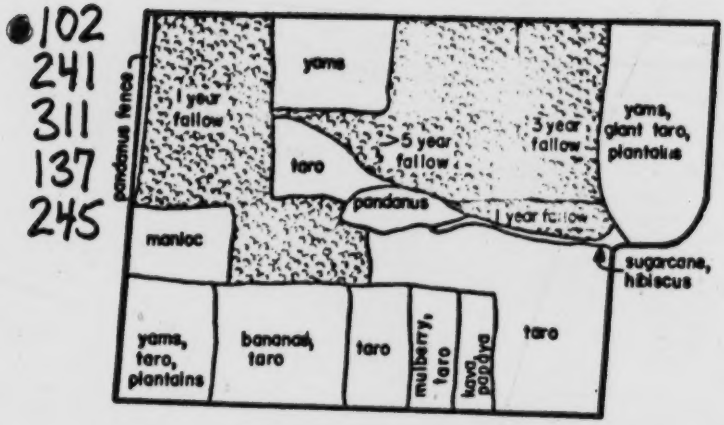
Distribution of Important Tree Species

(Coconut Coverage: 100% Mature Palms; 10% Replanted Palms.)

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

Figure 23. SAMPLE BUSH ALLOTMENT NO. 28

Location: Kolovai **Area: 12.00 Acres**



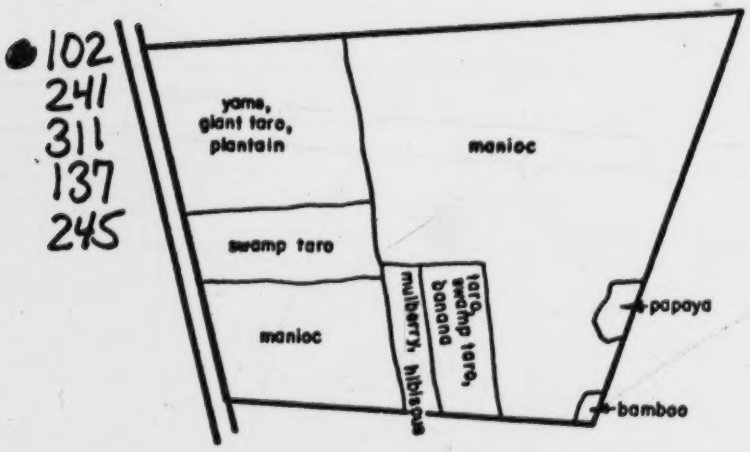
Distribution of Major Crops

Distribution of Important Tree Species
(Coconut Coverage: 50% Mature Palms; No Replanted Palms.)

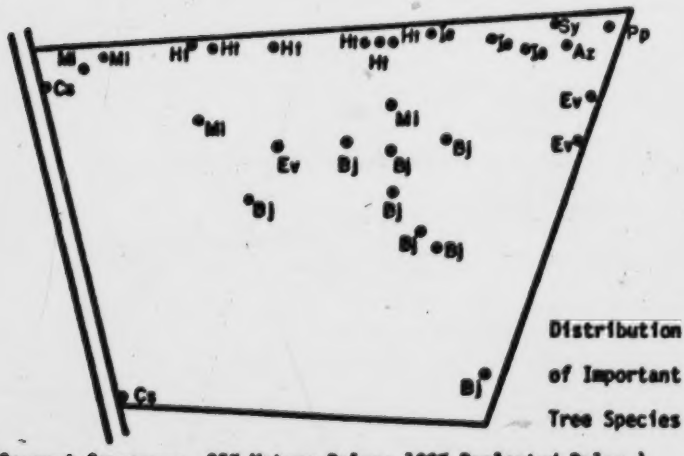
88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9 Tongatapu

Figure 24. SAMPLE BUSH ALLOTMENT NO. 30

Location: 'Ahau Area: 3.05 Acres



Distribution of Major Crops

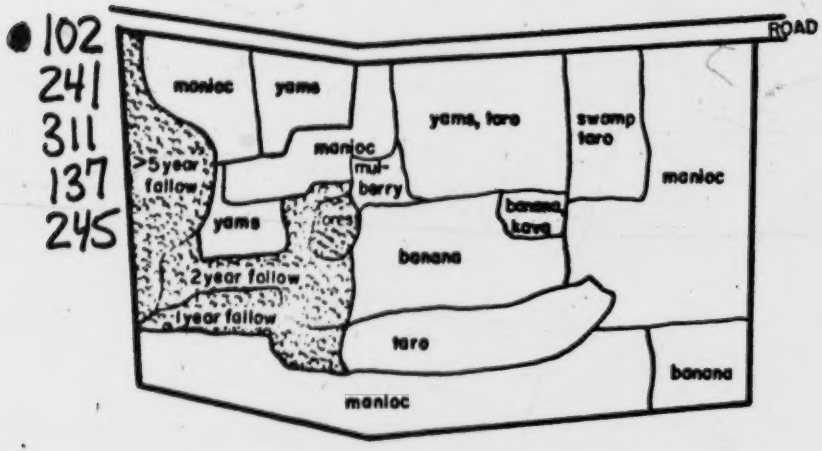


(Coconut Coverage: 25% Mature Palms; 100% Replanted Palms,)

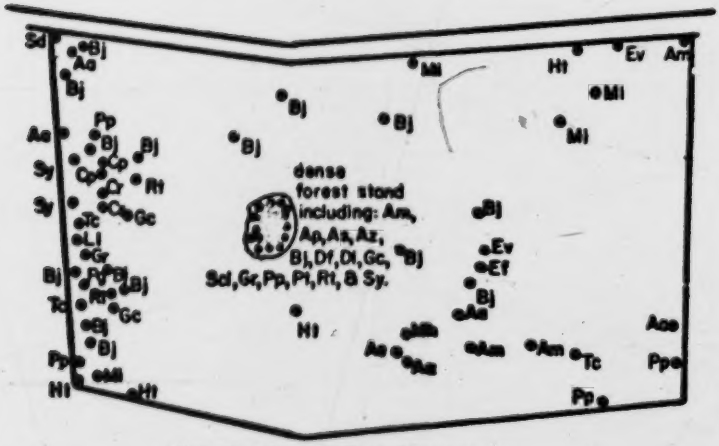
88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

Figure 25. SAMPLE BUSH ALLOTMENT NO. 31

Location: Ha'akili Area: 8.30 Acres



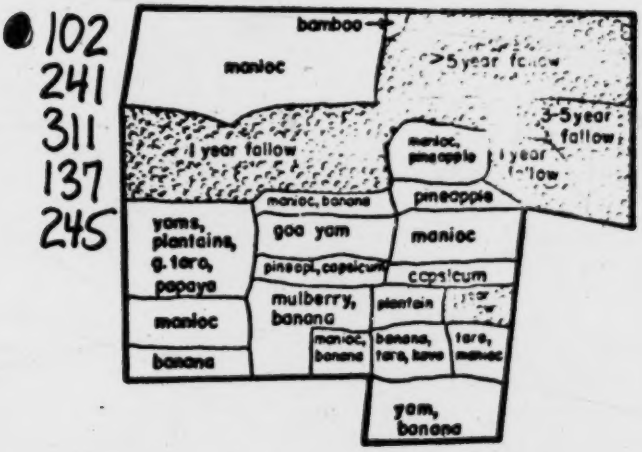
Distribution of Major Crops



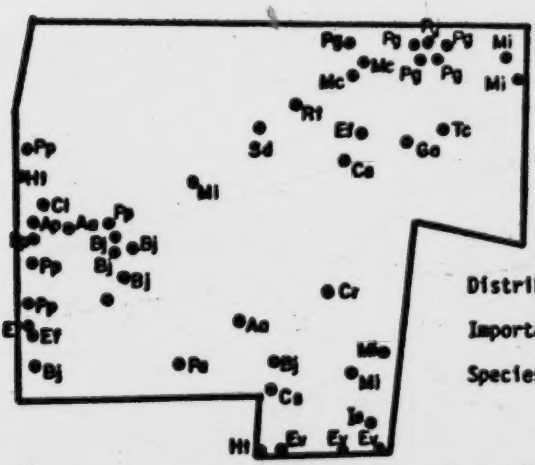
Distribution of Tree Species
(Coconut Coverage: 75% Mature Palms; 75% Replanted Palms.)

Figure 26. SAMPLE BUSH ALLOTMENT NO. 34

Location: Nelafu **Area: 6.22 Acres**



Distribution of Major Crops



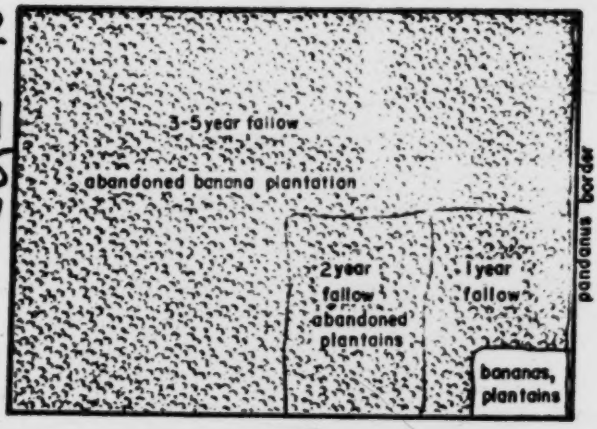
Distribution of Important Tree Species

(Coconut Coverage: 75% Mature Palms; 25% Replanted Palms.)

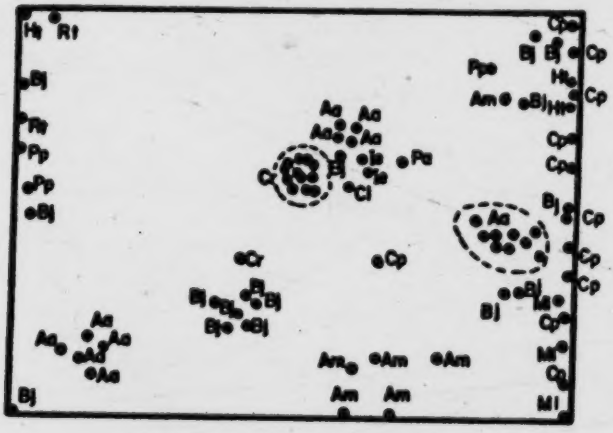
Figure 27. SAMPLE BUSH ALLOTMENT NO. 38

Location: Houma Area: 8.26 Acres

102
311
241
245
137



Distribution of Major Crops

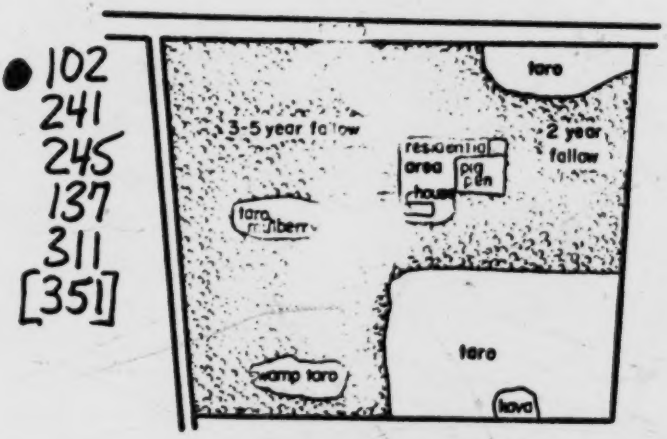


Distribution of Important Tree Species

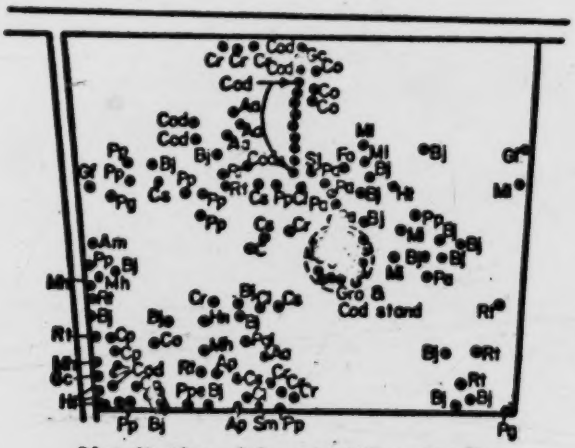
(Coconut Coverage: 10% Mature Palms; 5% Replanted Palms.)

Figure 28. SAMPLE BUSH ALLOTMENT NO. 39

Location: Houma Area: 8.26 Acres



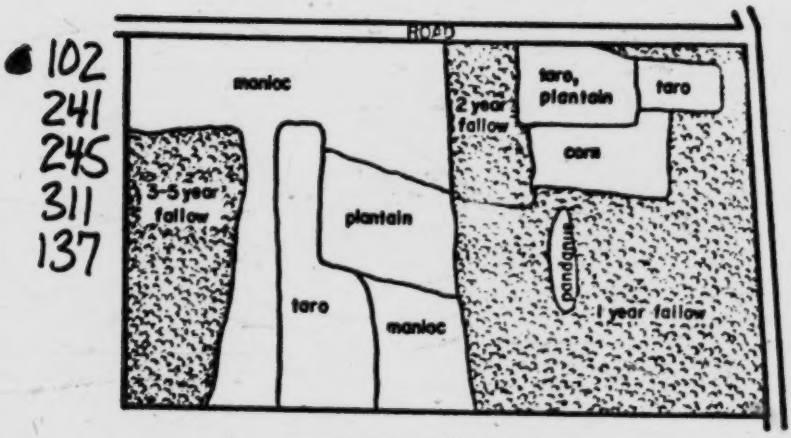
Distribution of Major Crops



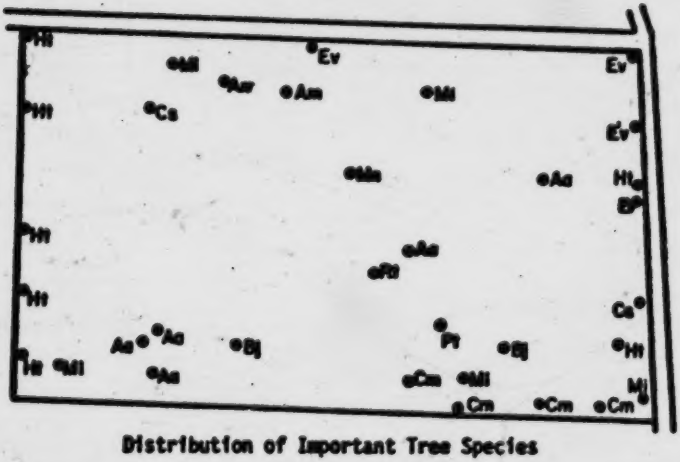
Distribution of Important Tree Species
(Coconut Coverage: 75% Mature Palms; 10% Replanted Palms.)

Figure 29. SAMPLE BUSH ALLOTMENT NO. 45

Location: Tokomololo Area: 8.40 Acres



Distribution of Major Crops



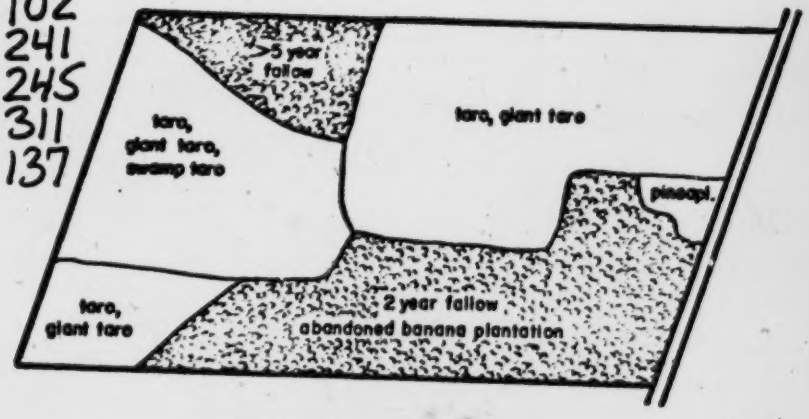
Distribution of Important Tree Species

(Coconut Coverage: 75% Mature Palms; 50% Replanted Palms.)

Figure 30. **SAMPLE BUSH ALLOTMENT NO. 46**

Location: Utulau **Area: 8.25 Acres**

102
241
245
311
137



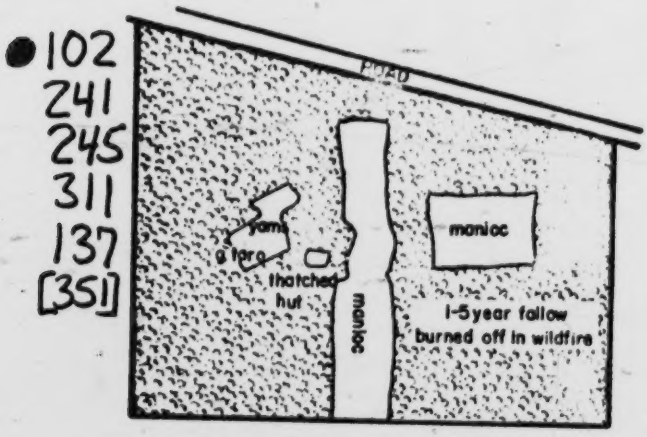
Distribution of Major Crops

Distribution of Important Tree Species

(Coconut Coverage: 75% Mature Palms; 5% Replanted Palms.)

Figure 31. SAMPLE BUSH ALLOTMENT NO. 53

Location: Vaini Area: 8.30 Acres



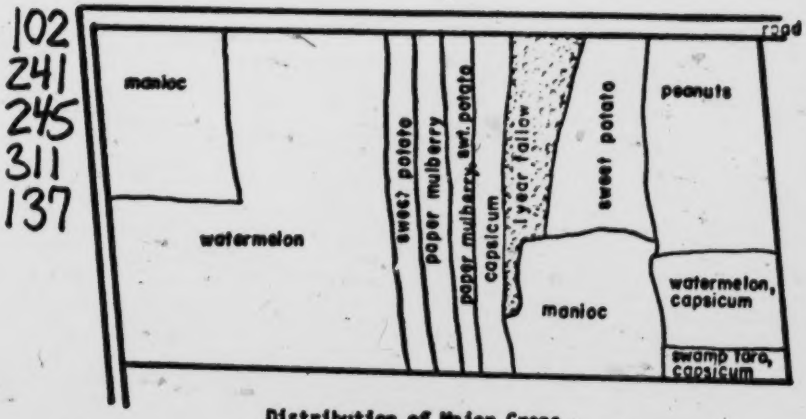
Distribution of Major Crops

Distribution of Important Tree Species
(Coconut Coverage: 25% Mature Palms; 10% Replanted Palms.)

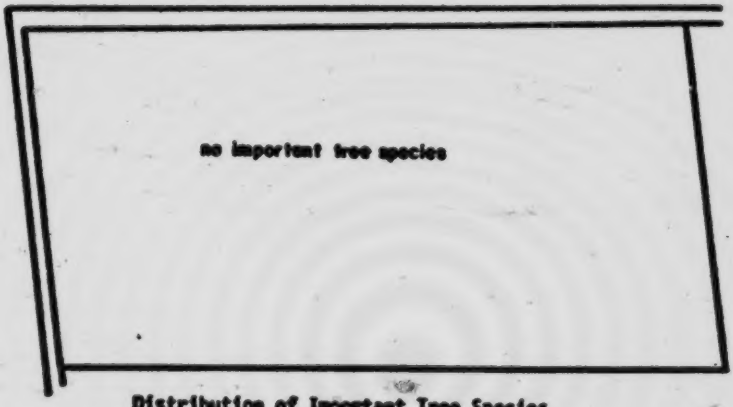
88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9 Tongatapu

Figure 32. SAMPLE BUSH ALLOTMENT NO. 56

Location: Vaini **Area: 8.25 Acres**



Distribution of Major Crops



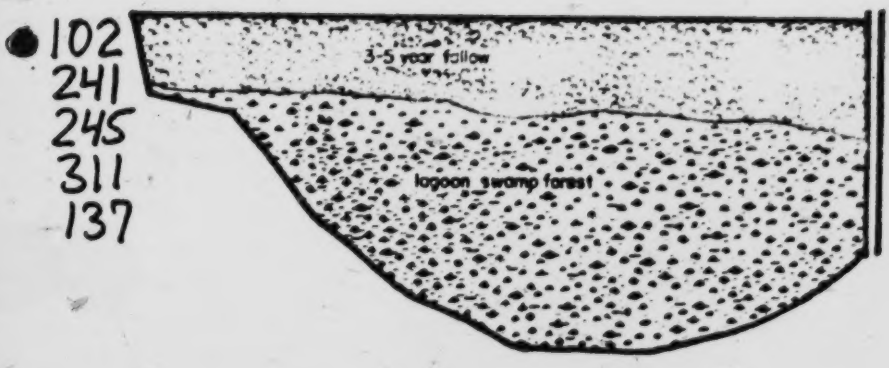
Distribution of Important Tree Species

(Coconut Coverage: No Mature Palms; 100% Replanted Palms.)

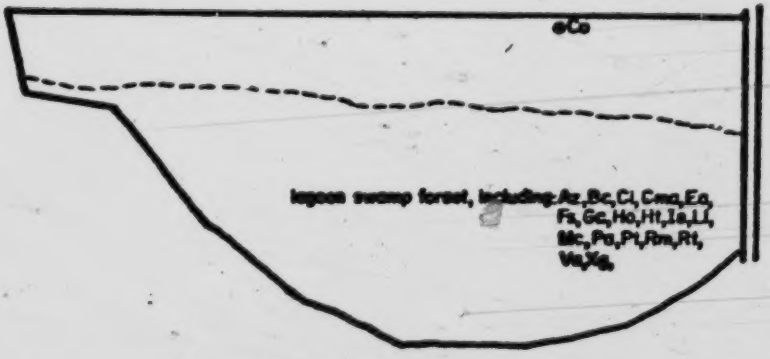
88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9 Tongatapu

Figure 33. SAMPLE BUSH ALLOTMENT NO. 60

Location: Folaha Area: 6.28 Acres



Distribution of Major Crops

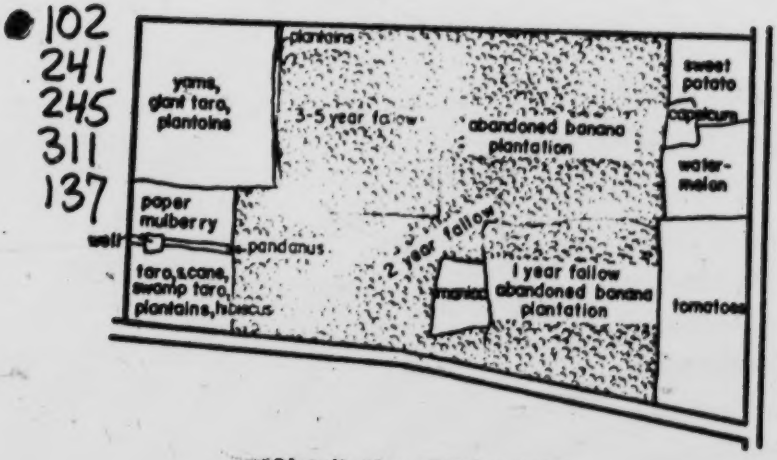


Distribution of Important Tree Species

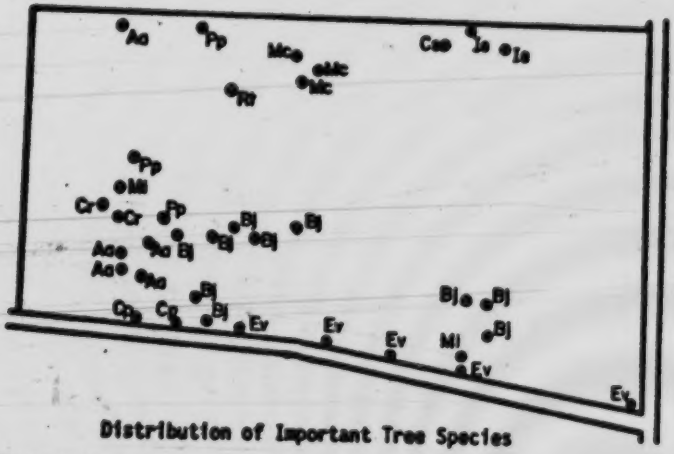
(Coconut Coverage: 100% Mature Palms on Useable Portion of Allotment.)

Figure 34. SAMPLE BUSH ALLOTMENT NO. 62

Location: Longoteme **Area:** 8.25 Acres



Distribution of Major Crops



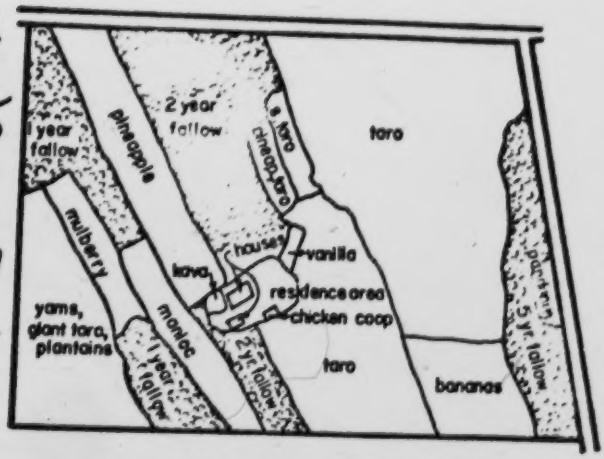
Distribution of Important Tree Species

(Coconut Coverage: 75% Mature Palms; 25% Replanted Palms.)

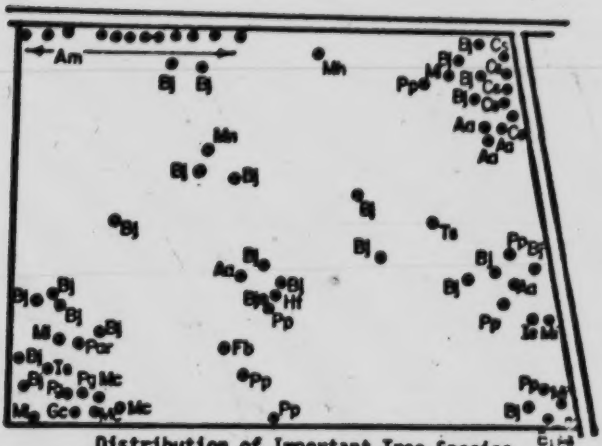
Figure 35. SAMPLE BUSH ALLOTMENT NO. 67

Location: Vaini 'uta Area: 8.25 Acres

102
241
245
311
137
[351]



Distribution of Major Crops



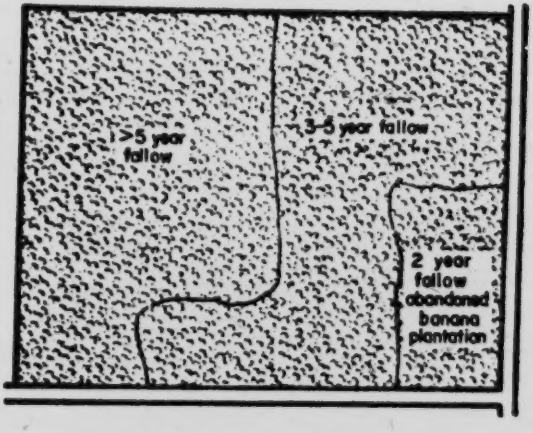
Distribution of Important Tree Species
(Coconut Coverage: 100% Mature Palms; No Replanted Palms.)

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9 Tongatapu

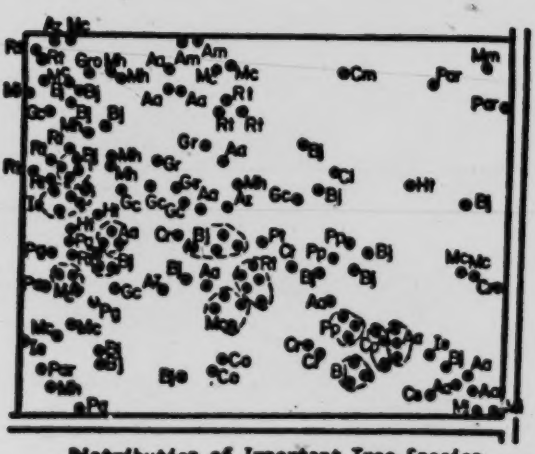
Figure 36. SAMPLE BUSH ALLOTMENT NO. 69

Location: Fua'amotu Area: 8.25 Acres

102
241
245
311
137



Distribution of Major Crops

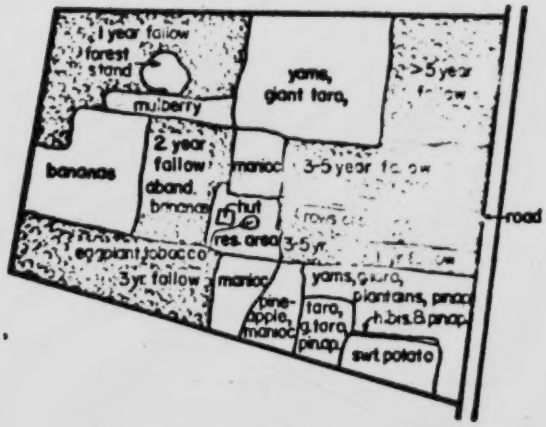


Distribution of Important Tree Species
(Coconut Coverage: 100% Mature Palms; No Replanted Palms.)

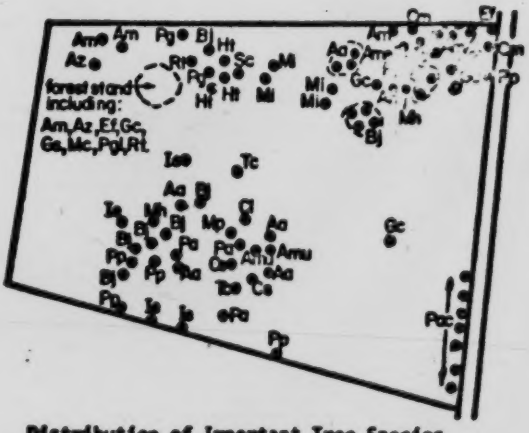
Figure 37. SAMPLE BUSH ALLOTMENT NO. 71

Location: Ha'asini Area: 8.01 Acres

102
241
245
311
137
[351]



Distribution of Major Crops



Distribution of Important Tree Species

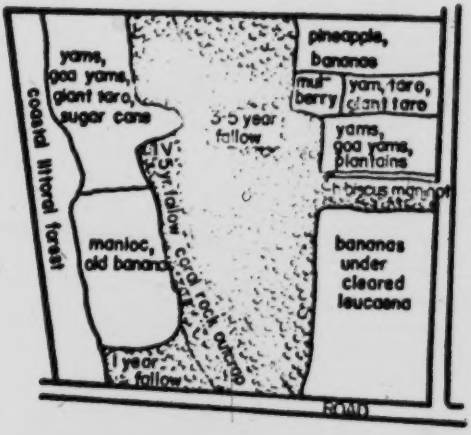
(Coconut Coverage: 10% Mature Palms; 5% Replanted Palms.)

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

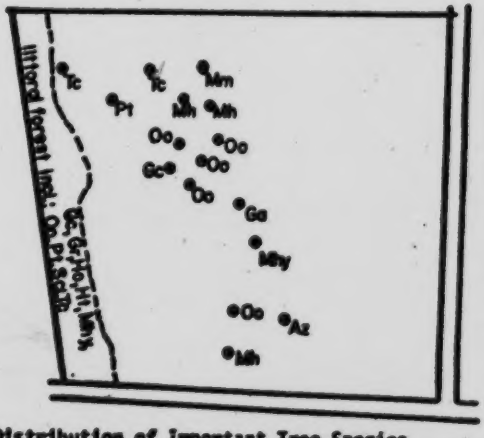
Figure 38. SAMPLE BUSH ALLOTMENT NO. 72

Location: Lavengatonga **Area:** 8.10 Acres

102
241
245
311
137



Distributionoof Major Crops

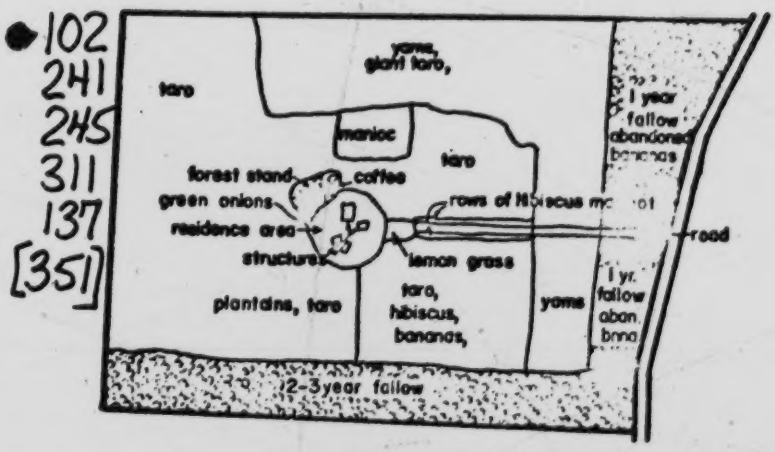


Distribution of Important Tree Species

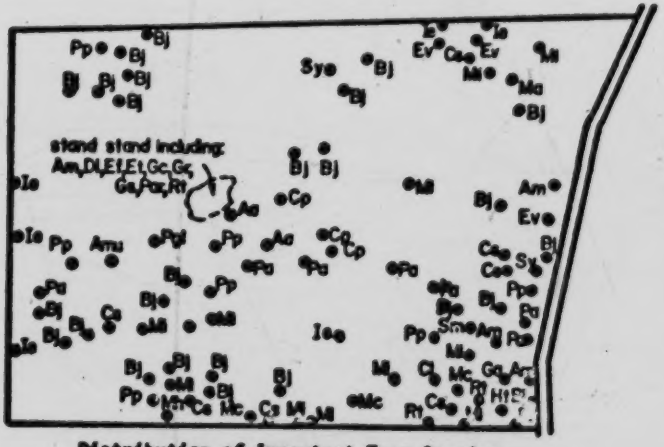
(Coconut Coverage: 25% Mature Palms; 10% Replanted Palms.)

Figure 39. SAMPLE BUSH ALLOTMENT NO. 84

Location: Lapaha Area: 10.00 Acres



Distribution of Major Crops



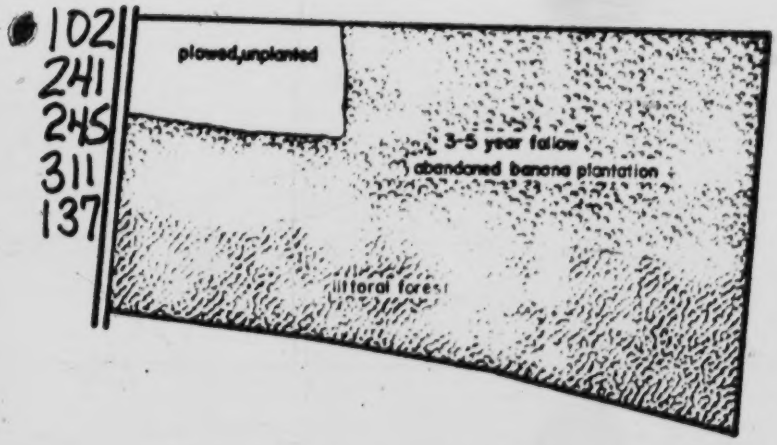
Distribution of Important Tree Species

(Coconut Coverage: 50% Mature Palms; No Replanted Palms.

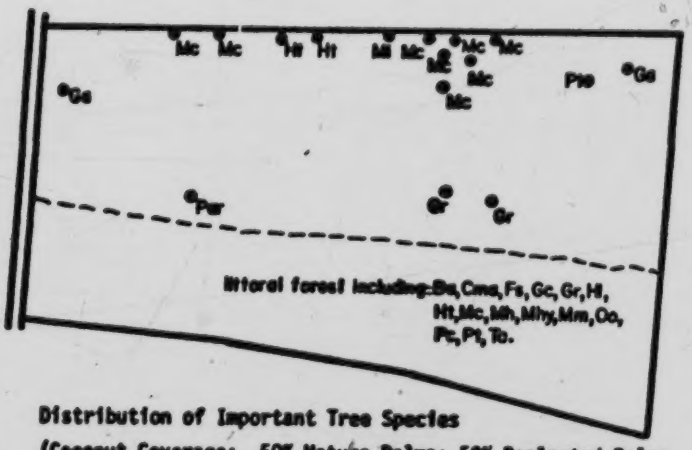
88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9 Tongatapu

Figure 40. SAMPLE BUSH ALLOTMENT NO. 87

Location: Lapaha 'uta Area: 8.25 Acres



Distribution of Major Crops



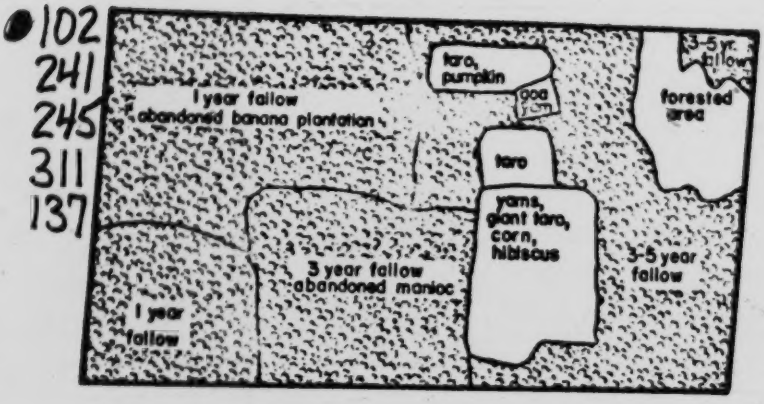
Distribution of Important Tree Species

(Coconut Coverage: 50% Mature Palms; 50% Replanted Palms on Usable Portion of Allotment.)

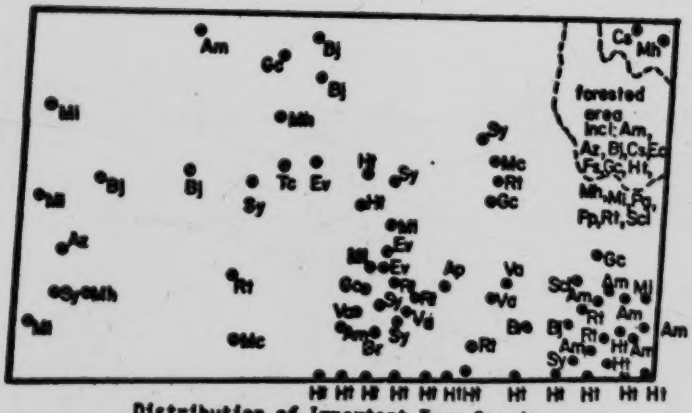
88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

Figure 41. SAMPLE BUSH ALLOTMENT NO. 101

Location: Talafo'ou Area: 8.25 Acres



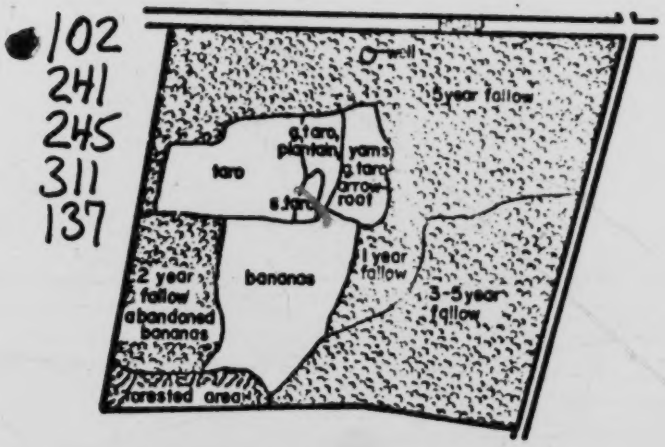
Distribution of Major Crops



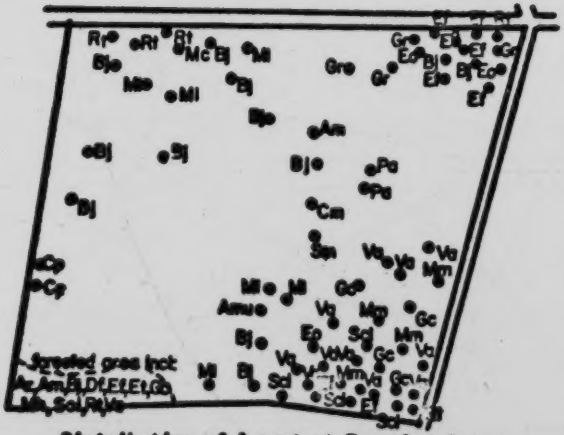
Distribution of Important Tree Species
(Coconut Coverage: 10% Mature Palms; 50% Replanted Palms.)

Figure 42. SAMPLE BUSH ALLOTMENT NO. 103

Location: Hoi Area: 8.26 Acres



Distribution of Major Crops



Distribution of Important Tree Species

(Coconut Coverage: 10% Mature Palms; No Replanted Palms.)

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

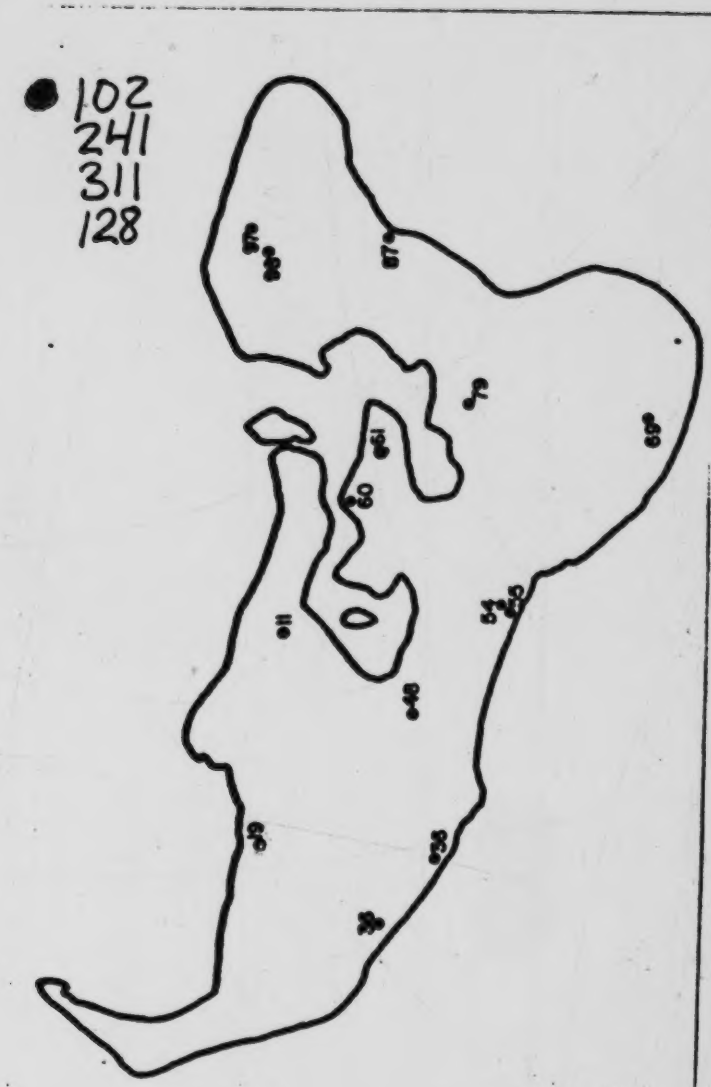
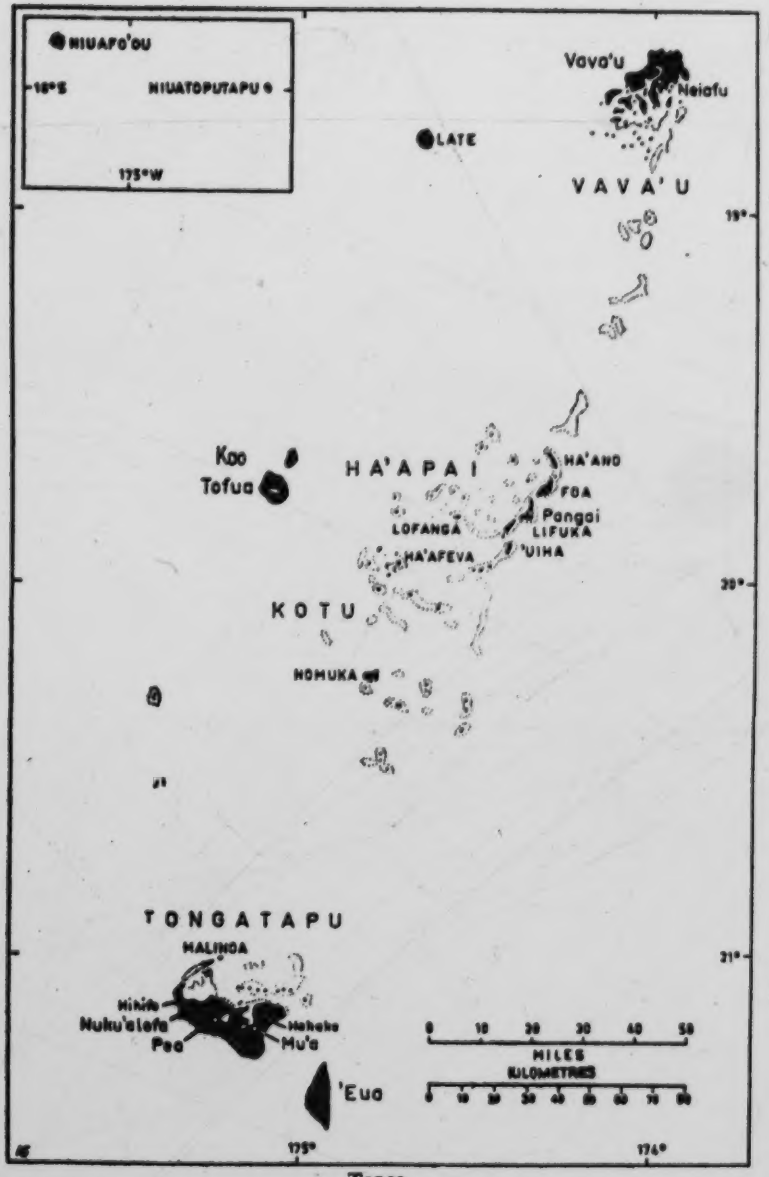


Figure 43. Outline map of Tongatapu showing the locations and sample numbers of of the 14 uncultivated allotments from the sample survey of 101 bush allotments. Such maps were prepared for each item in the survey of bush allotments.

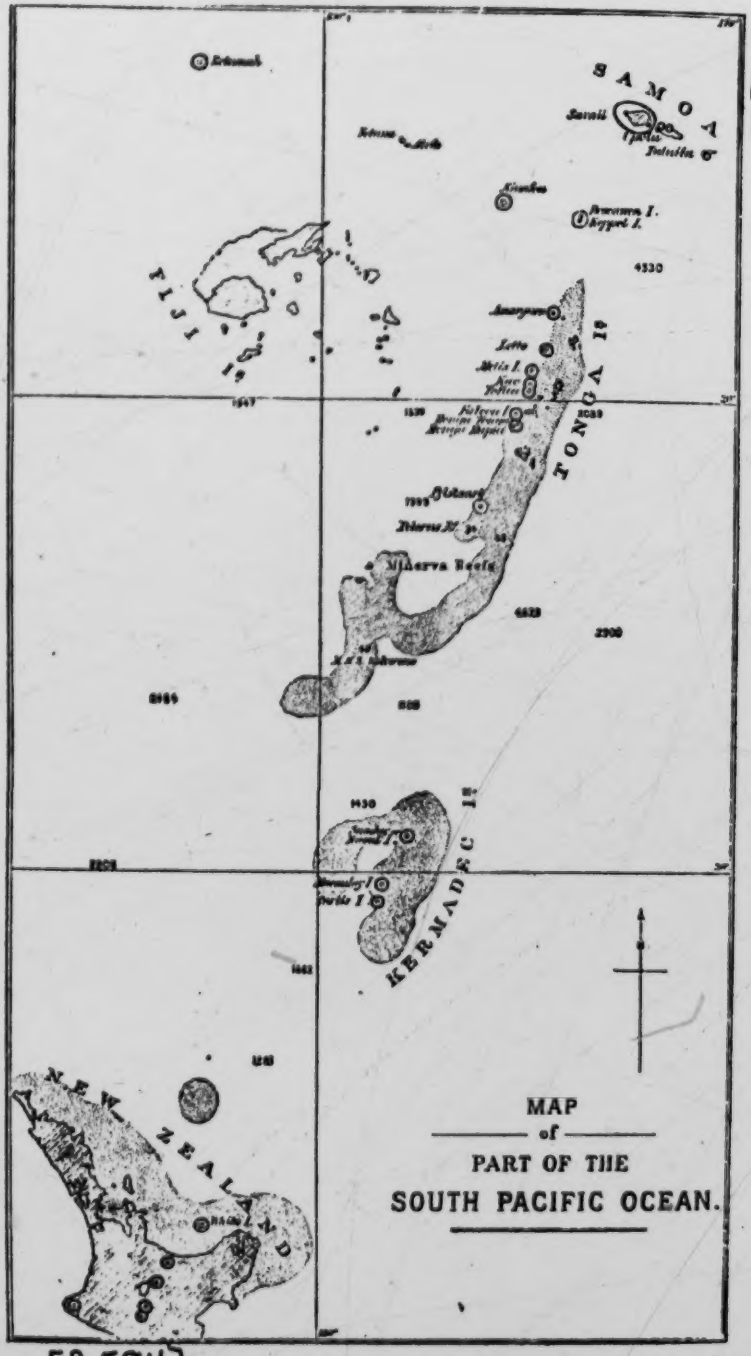
89: Wood M,Y-4,5 (1924-1937) 1975
OU9 Tonga OU9

102
131



Tonga

96: Lister N-5 (1889-1890) 1891
OU9 Tonga OU9



102
131
133

[P. 594]

96: Lister N-5 (1889-1890) 1891
OU9 Tonga OU9

Tongan volcanoes are members at right angles. It is significant that Savaii is the largest of either series, and is situated at the point where they intersect. Savaii ends the series in a northerly direction.

The soundings which have been taken in this part of the Pacific show that the Tonga Islands are situated on a ridge, which rises to within 1000 fathoms of the surface and is prolonged in a south-westerly direction for half the distance between this group and New Zealand. To the south of the Tonga Islands the top of the ridge reaches the surface of the sea, or comes close to it, at the Minerva Reef and three shoal patches indicated in the chart.

On the eastern side, where soundings have been taken, the slope descends to depths of over 2000 fathoms, and at two points, one to the north-east of Vavau, the other to the east of the southern extension of the ridge, the very great depths of 4530 and 4428 fathoms have been sounded.

On the west the slope appears to be less steep, but a depression (with a depth where it has been measured of over 1500 fathoms) lies between this ridge and the Fiji group.

The Kermadec Islands, lying between the southern part of the ridge and New Zealand, are the highest points of a large area which is also within the 1000-fathom line. It is, however, separated from the Tonga ridge to the north and New Zealand to the south by depths of over 1500 fathoms.

Both elevations are traversed by a line of volcanoes, which, as Mr. S. Percy Smith * has pointed out, continues the direction of that of the Taupo Zone of New Zealand. Mr. Smith suggests that the volcanoes are situated in the course of a great fissure which extends from Ruapehu, at the southern end of the Taupo Zone, through the Kermadec and Tonga groups to Samoa. This view receives some support from the fact that the eruption of Falcon Island, beginning in Oct. 1885, was contemporaneous with the increased activity (in November) of the geyser of the white terrace of Lake Rotomahana, which preceded the great explosion of Tarawera in June of the following year.

[In the map facing this page the dotted areas between New Zealand and the Tonga Islands indicate depths of less than 1000 fathoms. (The eastern limit of the Kermadec area is undetermined.)
The thick circles indicate active or extinct volcanoes, the broken circles islands whose volcanic nature is doubtful.]

(b) *Islands formed of Sedimentary Volcanic Material.*

Belonging to this division are several islands in the Hapai Group, and the island of Eua.

The Nomuka Group, which forms the southern division of the Hapai Islands, consists of a number of small islands which are the highest points of an extensive plateau. Over a large area the top of this plateau is within 50 fathoms of the surface of the sea.

* 'Geological Notes on the Kermadec Group,' Trans. N. Z. Inst. vol. xx. p. 333.

96: Lister N-5 (1889-1890) 1891
OU9 Tonga OU9

[Tongatabu]

channel is composed of a higher central area, separated by a rapid descent from the lower peripheral part. It has evidently been elevated in two stages.

IV. Conclusion.

The view of the mode of formation of the Tonga atolls suggested in Darwin's 'Coral Reefs,' is that they grew during a period of subsidence, when the volcanoes of the group were inactive, and that elevation has occurred simultaneously with a recent volcanic outbreak *. Dana also considers that the islands were formed during subsidence, and regards the elevation which has taken place as merely a local phenomenon †. The additional information on the group which we now possess appears to make a different view of the formation of these islands more probable. It is clear that elevation has been in progress for a long period, and has been renewed again and again after intervals during which reefs of considerable extent have grown; it has to a greater or less extent affected all the larger divisions of the group, while at Vavau and Eua reef-structures have been raised to heights of over 500 and 1000 feet.

Such an elevatory movement is quite in keeping with the presence of the line of volcanoes which traverses the group, and I am not aware that there is any evidence that these have, as a whole, passed through a quiescent stage previous to their activity in recent times.

With regard to atolls in general, one reason for considering them to have been formed during subsidence is the improbability of there being any other basis than a subsided island on which the reefs could have grown. In the Tonga Islands, however, the soundings of H.M.S. 'Egeria' show that Tongatabu and Nomuka rest on shallow banks, and where the underlying basis of the islands is exposed, as in the Nomuka group and at Eua, it is seen that they consist of layers of volcanic materials laid out under water. The process now going on at Falcon Island illustrates the way in which a volcanic mound, composed of soft material and originally standing above the sea, may be reduced to a submarine bank, and so form a basis for coral growth.

In consideration of these facts it appears probable that the atoll-shaped islands of the southern part of the Tonga Group have grown on banks of volcanic material laid out in shallow water, and that there is no necessity to call in the hypothesis of subsidence to account for their formation.

EXPLANATION OF PLATE XXIII.

Map of the Tonga Islands. The map of Eua is prepared partly from the survey of H.M.S. 'Egeria' (1888). The outlines of the patches of volcanic formation in the central part of the island are not accurately drawn.

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* 'Coral Reefs,' 3rd ed. pp. 177, 186, 188.

† 'Origin of Coral Reefs and Islands,' Am. Journ. Sci. ser. 3, vol. xxx. (1885) p. 99.

96: Lister

OU9 Tonga OU9

102
131
133

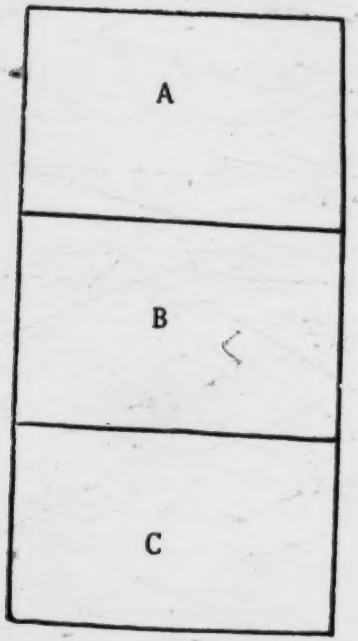
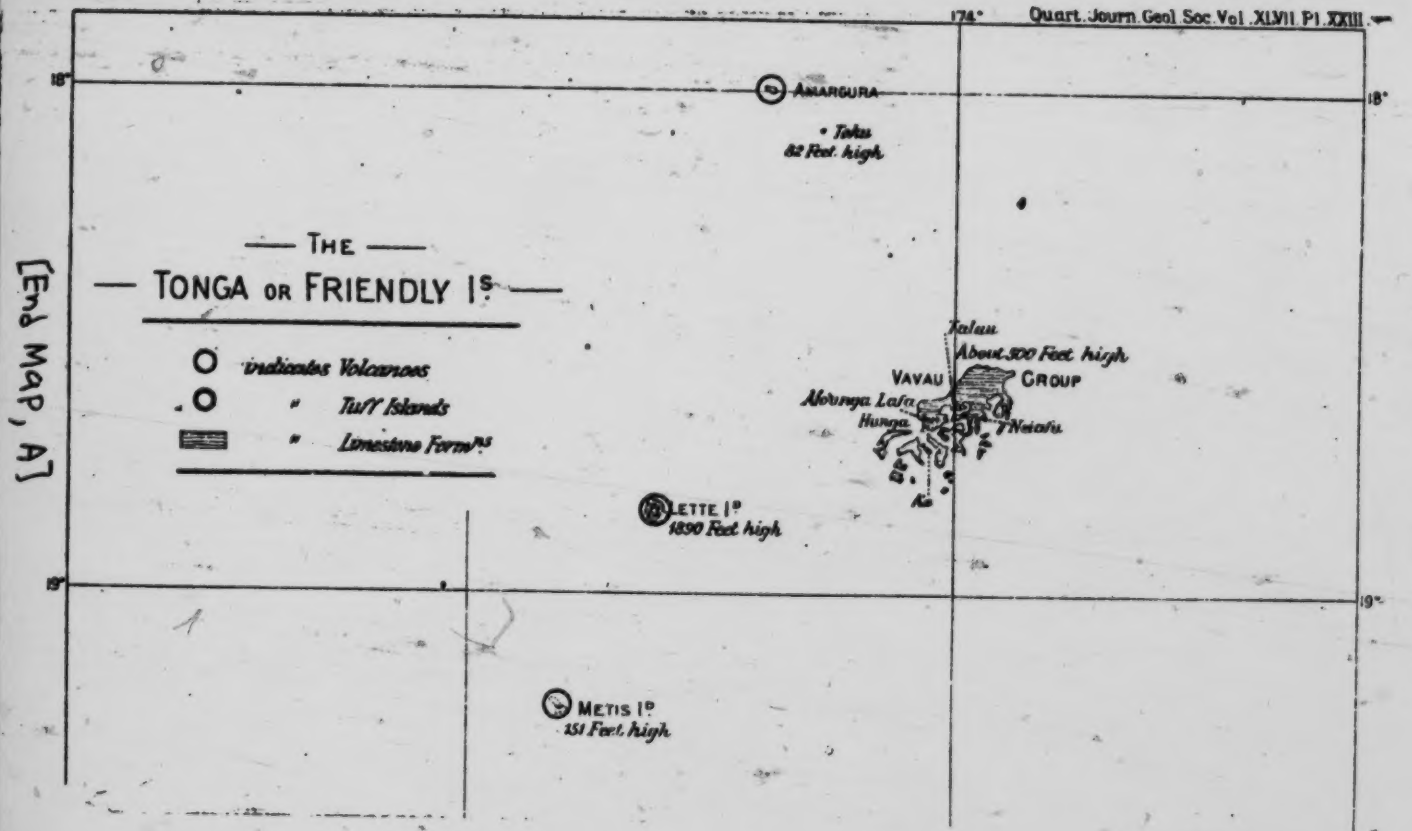


Chart of Positions of End Map [facing End Map]



[End MAP, A]

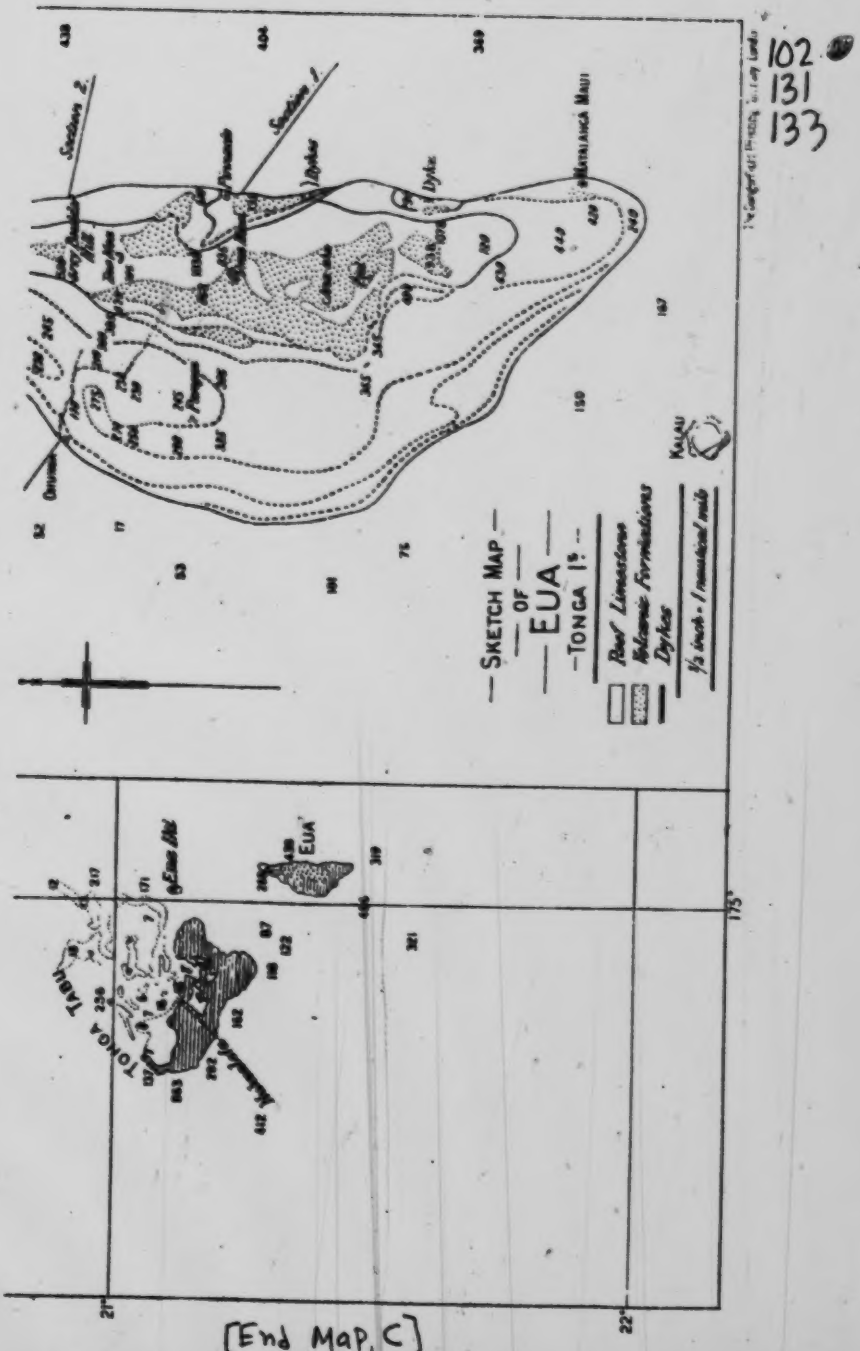
96: Lister N-5 (1889-1890) 1891
OU9 Tonga OU9
102
131
133

102
131
133

96: Lister N-5 (1889-1890) 1891
OU9 Tonga OU9

[End Map, B]

96: Lister N-5 (1889-1890) 1891
OU9 Tonga OU9



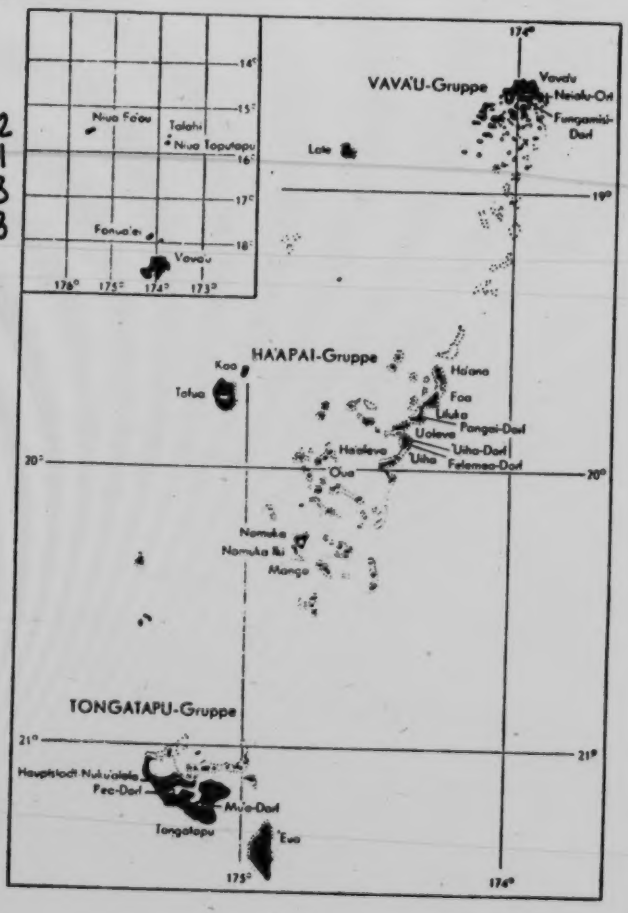
102
131
133

[End Map, C]

100: Koch--507 E-4,5 (1951-1952) 1955 OU9 Tonga OU9

/360/

102
131
133
103



/map/

101: Clark K-4,5 (1974) 1978 OU9 Tonga OU9

102
241

Figure 1.--Planting of the Tongan 'Api.

1A. 8.25 acres

1B. 4.76 acres

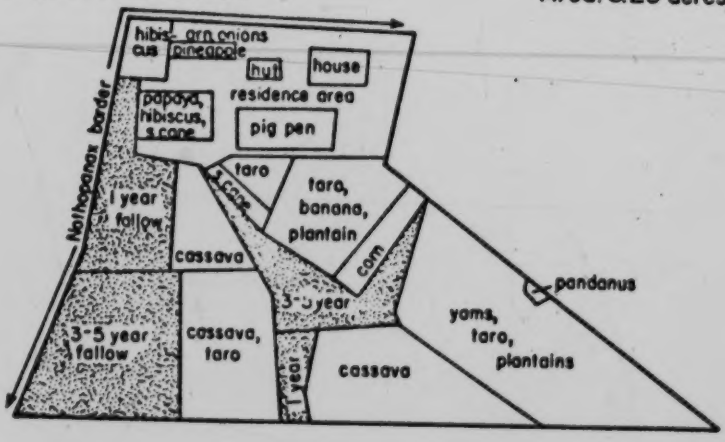
SOURCE: R. R. Thaman, "The Role of the Tongan Agricultural System in Fulfilling the Subsistence Needs of the Tongan Society," R. W. Parkinson Memorial Lecture, School of Social and Economic Development, University of the South Pacific, September 26, 1974.

102
241

DISTRIBUTION OF MAJOR CROPS AND FALLOW

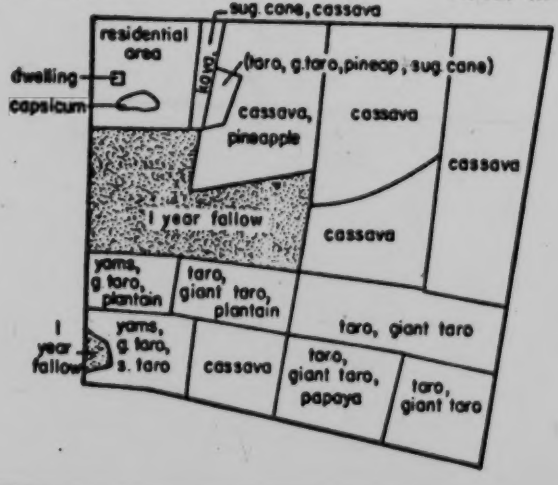
Sample Bush Allotment

Area: 8.25 acres



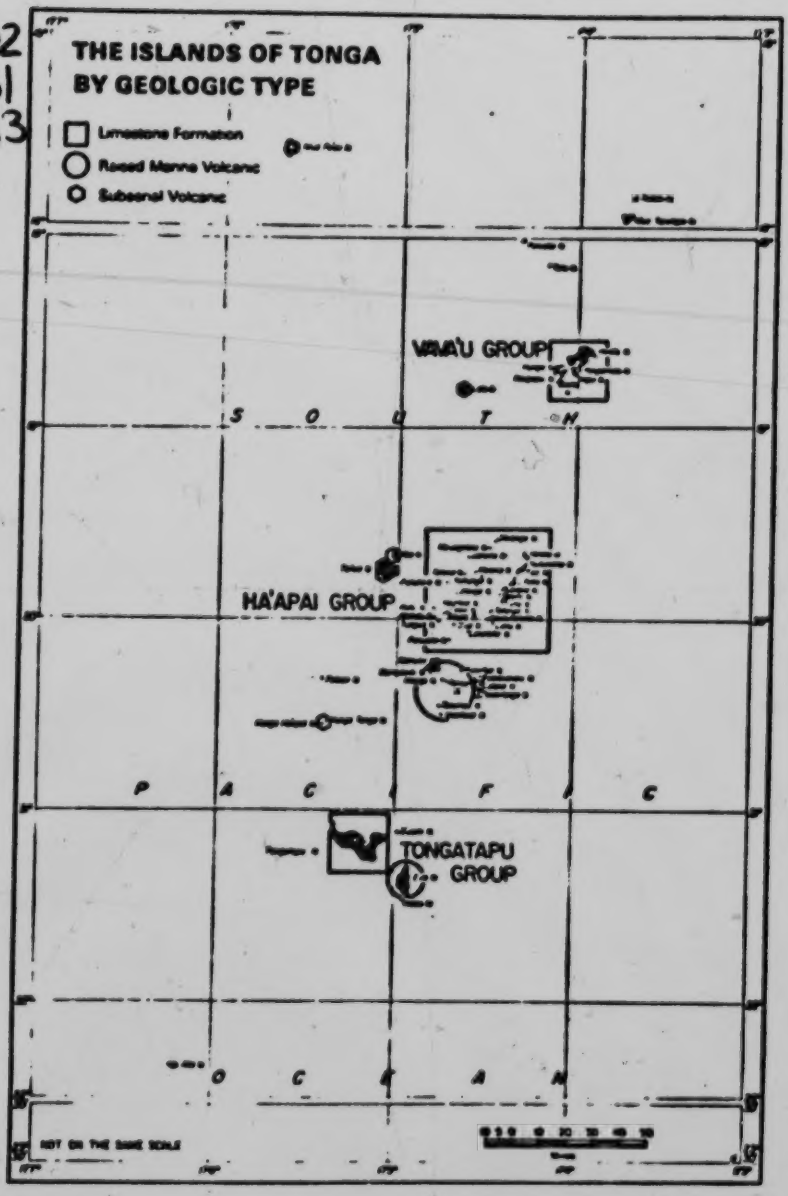
Sample Bush Allotment

Area: 4.76 acres



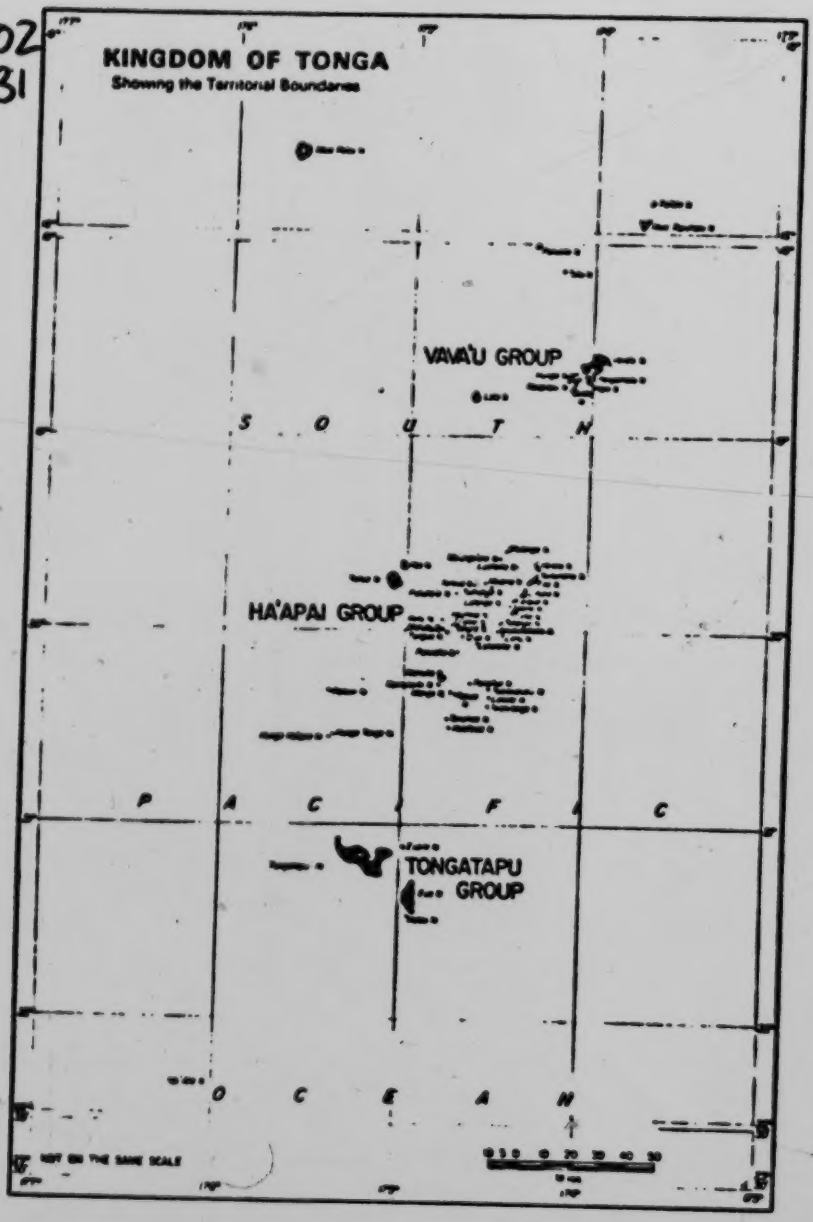
101: Clark K-4,5 (1974) 1978 OU9 Tonga OU9

102
131
133



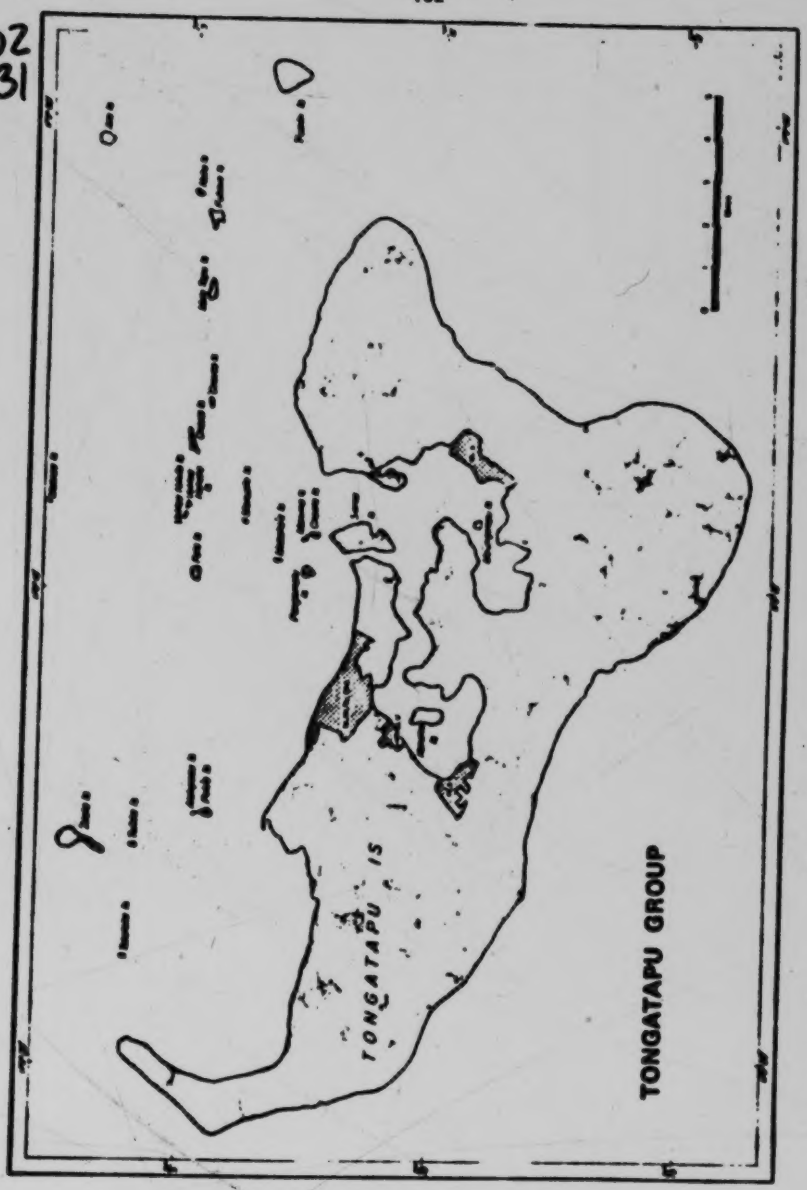
101: Clark K-4,5 (1974) 1978 OU9 Tonga OU9

102
131



101: Clark. K-4,5 (1974) 1978 OU9 Tonga OU9

102
131



101: Clark K-4,5 (1974) 1978 OU9 Tonga OU9

102
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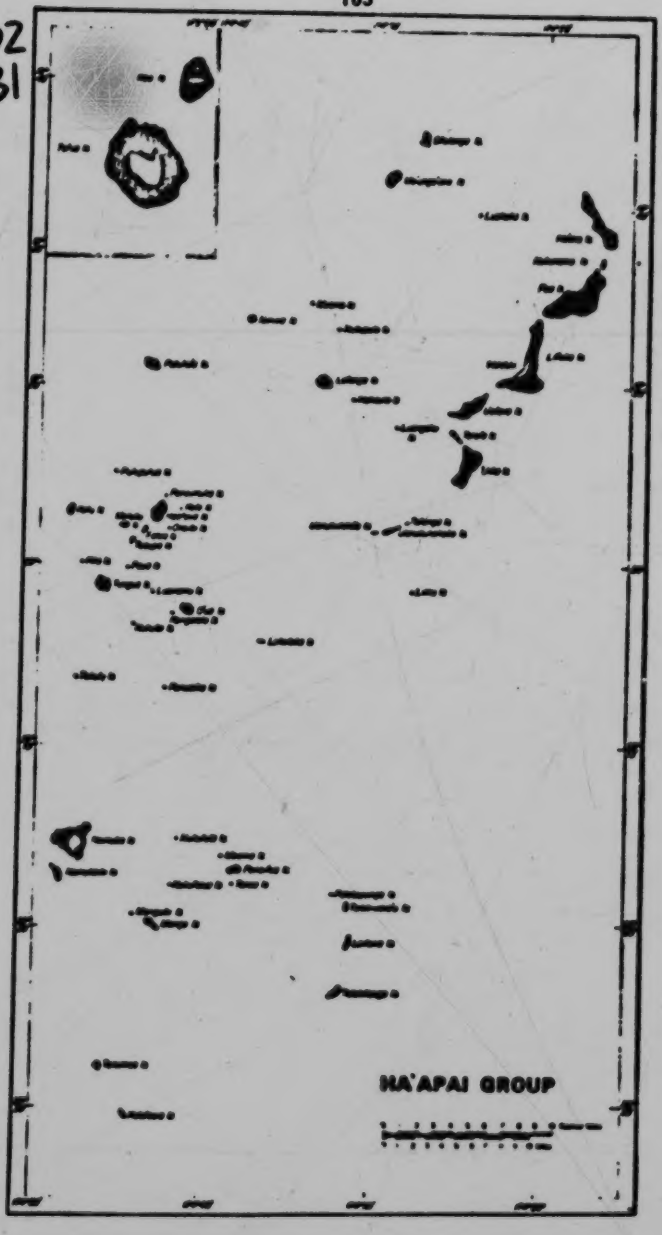

101: Clark K-4,5 (1974) 1978 OU9 Tonga OU9

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